



**FULL ARTICLE**

# Migration and institutional quality across Italian provinces: The role of human capital

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**Abstract**

A recent literature strand has emphasized the importance of international migration on the institutional quality of sending and receiving countries. On the contrary, there is no evidence of the effects of intra-national, interregional mobility on government quality, a phenomenon which is particularly relevant in countries affected by significant internal dualism. Using a system generalized method of moments (SYS-GMM) estimator on a 2004–2012 panel dataset, this paper empirically investigates the relationship between internal net-migration and institutional quality of Italian provinces. The findings show that migration has a relevant and positive effect on the quality of institutions only when the human capital content is taken into account.

## 1 | INTRODUCTION

During the last few decades the increasing role of institutions as a source of economic development has raised the interest of scholars in the mechanisms that are able to improve the quality of institutions. In particular, a growing theoretical and empirical literature has demonstrated that migration could have important consequences on institutions.

Furthermore, as human capital has become more and more intensive (over 20 million high-skilled individuals who live in the OECD area are migrants), both researchers and policy-makers have focused attention on the consequences of human capital mobility on institutional quality. A higher skill intensity embodied in the migration flows, indeed, contributes to the modification of the human capital accumulation in the sending and receiving places. Consequently, the ability of migration to affect the level of institutions could be reinforced by the educational structure of migrants (Beine & Sekkat, 2013; Docquier, Lodigiani, Rapoport, & Schiff, 2016; Li, McHale, & Zhou, 2016).

The relationship between migration and institutions has been investigated from different perspectives. On the one hand, a strand of research has focused the attention on the impact on the origin country, highlighting a beneficial effect related to the ability of migrants to transfer norms, values and institutions from the receiving country to the



origin place (the so called 'diaspora' effect) (Beine & Sekkat, 2013; Chauvet & Mercier, 2014; Docquier et al., 2016; Spilimbergo, 2009). On the other hand, other studies have provided evidence of a positive effect on the receiving country, suggesting that the changes in institutions descend from the migrant participation in the political process of the destination country (Clark, Lawson, Nowrasteh, Powell, & Murphy, 2015; Powell, Clark, & Nowrasteh, 2017).

Analogous consequences have also been found when investigating the effect of international immigration on institutions at regional level. In particular, Padilla and Cachanosky (2017) found that the immigrants and foreign naturalized citizens positively contribute to improve the American states' institutions. However, to the best of our knowledge, the effects of internal flows between regions and sub-regions within the same country have not been studied yet.

The present paper, by adopting recently available datasets, aims at investigating the causal nexus between internal migration and institutional quality across Italian provinces and whether and to what extent the skilled mobility affects the quality of institutions, once a set of important variables (productive structure, degree of regional openness, ethnic fractionalization and population density) that contribute to determine institutions is controlled for. These analyses seem to be particularly interesting within the Italian context which is characterized by a massive brain drain from the Southern provinces to the Central-North and by a persistent internal economic and institutional dualism.

We first estimate the effect of net-migration on institutional quality for all migrants, without considering the skill intensity of these flows (i.e. "skill-neutral" migration). Second, adopting the Italian National Institute of Statistics' dataset (ISTAT), that provides a subdivision of migration flows in terms of educational level, we measure the human capital embedded in the migration flows in order to test the impact of selective migration through a proxy based on the average level of education. The main advantage of adopting a net-migration flows rather than considering the unilateral in-flows and out-flows is related to the possibility to observe the final net effect of migration on the human capital accumulation process in the destination province (Ariu, Docquier, & Squicciarini, 2016; Fratesi & Percoco, 2014).

The main results indicate a positive relationship between human capital net gain and institutional quality. In particular, we find a statistically significant impact only when the educational level is considered, suggesting that the impact is fully driven by the human capital content of internal migration. The paper also adds to the existing literature, suggesting that intra-national skilled migration is contributing to widening the institutional disparities in Italy.

The shift from an international perspective to an intra-national point of view allows us to obtain several benefits and thus raises the necessity to produce further empirical contribution at this level of analysis. First, as pointed out by Fujita, Krugman, and Venables (1999), despite the same theoretical framework, the absence of cultural, linguistics and other forms of barriers within a national context makes the internal migration more intensive in comparison to cross-country migration. Therefore, the regional models on migration effects could be more suitable than models of international migration independently from the degree of openness of a country to the international immigration. Second, empirical models that look at intra-national level could benefit from a higher heterogeneity of the structural characteristics that contribute to determine institutions that tend to be constant across countries. Third, as largely emphasized, the analysis at national level could lead to biased estimation results due to the significant variations in terms of institutional quality among regions and sub-regions of the same country (Charron, Dijkstra, & Lapuente, 2014).

The econometric analysis is carried out by merging the dataset provided by the Italian National Institute of Statistics (ISTAT) on bilateral migration flows by educational level among the Italian provinces over the period 2004–2012 and the dataset provided by Nifo and Vecchione (2014) on institutional quality. Nifo and Vecchione (2014) aggregate twenty-four elementary indexes into five different variables (voice and accountability, government effectiveness, regulatory quality, rule of law, and control of corruption), each of which is able to capture the political and economic dimensions of institutions according to the World Governance Indicators (WGI) of the World Bank proposed by Kaufmann, Kraay, and Mastruzzi (2011). Our work adds to the literature investigating the role of skilled migration on each different component of institutional quality.

This kind of investigation presents two important identification issues. First, when we look at the effect of migration on institutional quality, the reverse causality among them could bias the estimation results. In particular, different



studies have demonstrated that the institutional quality represents an important determinant of migration, as it is included into the human capital decision to re-locate (Ariu et al., 2016; Nifo & Vecchione, 2014). Second, Acemoglu, Johnson, Robinson, and Yared (2005) highlight that, in this context, the relationship between education and institutions could be driven by omitted factors able to affect both the variables. Therefore, a pooled cross-sectional regression could lead to biased estimation results.

For these reasons, the empirical analysis is carried out by implementing a dynamic panel data econometric model and, in particular, a SYS-GMM of Blundell and Bond (1998) in order to account for both the endogeneity issues and the time-invariant provincial characteristics.

The remainder of the paper is organized as follow. Section 2 provides the literature background. In sections 3 and 4, the descriptive analysis, the econometric model and the results are presented. Section 5 concludes the paper.

## 2 | THEORETICAL FRAMEWORK

### 2.1 | Migration and institutions

There is a large consensus on the role of institutions as a crucial factor able to affect the economic development in modern economies. The institutional changes represent a complex process that presume a strong interaction between institutions and organizations over time. The former are the rules of the game while the organizations are the players. In other words, the institutional framework is the structure of incentives chosen by a given society and the constraints that the human being tends to establish, while the organization consists of groups of individuals connected by a common goal (Acemoglu et al., 2005; North, 1990, 2005).

The growing importance of institutions has raised the interest of scholars in the mechanisms able to improve the quality of government. In particular, great attention has been paid to the link between migration and institutions. Furthermore, during the last few decades, as a part of the globalization process, the composition of migration has been subject to a deeper transformation with an increasing share of skilled individuals. The increasing international and intra-national migration, together with a growing share of high-skilled migrants, indeed, have modified the national and regional human capital distribution. All these changes, regarding the mobility trend, have encouraged scholars to reconsider the effects and consequences of migration.

In particular, the economic literature, given the recognize importance of institutions as a source of long-run economic growth (Rodríguez-Pose, 2013; Rodrik, 2007) has paid the attention to the potential effect of inflows and outflows of international migration on institutional quality on both origins and destinations.

The majority of contributions concerning the emigration effects on the domestic institutions (the so called 'diaspora' effect) focus on the cross-country mobility. In particular, in a seminal empirical study, Spilimbergo (2009) investigates the consequences of return migration on democracy. The author analyses the effect of a sample of individuals who have attained their education abroad on the institutions of their home country. The results show that foreign-educated individuals promote democracy in their home country, but only if the education is acquired in countries with a high level of democracy.

Additionally, Chauvet and Mercier (2014) explore the relationship between return migration and the transfer of political norms, proxied by the participation rate and by the electoral competitiveness of the origin country. Once they have instrumented the return migration, by using historical and distance variables, the authors find a positive effect of this kind of migration on political outcomes. These results seem to confirm that the return migration is an effective mechanism able to transfer norms, rules and institutions from the destination country to the country of origin.

Docquier et al. (2016) assess the role of international migration on the quality of institutions over the period 1985–2010. Differently from the paper of Spilimbergo (2009), the authors consider not only foreign students, but all migrants. Through the adoption of three different methodologies in order to account for the endogeneity between



migration and institutions, they highlight that international emigration is an important determinant of home country institutions. In particular, countries with a higher level of emigration rate are also those that experience the main improvements in terms of institutional quality.

Beine and Sekkat (2013) add to this literature by examining two different effects of international migration on home country institutions. They analyse the impact of emigration on the quality of institutions and consequently they try to assess whether and to what extent emigration contributes to the transfer of norms between host and home country. The results give evidence of a positive effect of emigration on the change in institutions. Moreover, when the authors test the role of skilled-emigration, the relationship is reinforced. Therefore, the educational level of migrants represents an important element, able to affect the institutional quality in the sending countries. Finally, if the emigrants are located in countries with a higher level of institutions, the benefits for the home country are greater.

Finally, Li et al. (2016) distinguish the mobility effects of the most skilled individuals on the economic and political institutions once they control for the domestic human capital. The results show a positive relationship between the brain drain and the country's political institutions. On the contrary, the outflows of human capital exert a negative impact on economic institutions.

In summary, these studies have highlighted the beneficial effects for the country of origin of the international emigration. More specifically, cross-country mobility represents a transmission channel that improves the institutions in the sending country. The possibility to emigrate can increase the bargaining power of the most skilled individuals and this, in turn, could force the governments to improve the quality of services in order to avoid a massive emigration of the most educated individuals (Li et al., 2016). Moreover, a recent literature strand suggests that the prospect of emigration due to the higher return on skill abroad can foster the actual investment in human capital formation. More people, therefore, invest in human capital and if at the end of this process only a proportion of these mostly educated individuals would emigrate then the remaining human capital would increase with important consequences for the overall economy (Beine, Docquier, & Rapoport, 2001; Mountford, 1997; Vidal, 1998). Furthermore, when the institutional quality is too low, most likely because the public decisions are inspired to criteria too far from the optimal social well-being, the emigration could be a sort of silent revolution aimed at improving institutions (Li et al., 2016).

The literature background is also enriched by a number of recent studies that devotes the attention to the consequences of international immigration on institutional quality in the destination places both at the country level and at the intra-national level. In particular, in an important theoretical analysis, Borjas (2015) states that the mobility from countries with a lower level of institutions has a detrimental effect on institutional quality of the United States.

However, this idea has been discarded by a recent empirical study focused on the relationship between foreign-born immigrants and institutional quality, which indicates a gain in institutions due to immigration. Clark et al. (2015), for instance, empirically examining the impact of immigrants on different dimensions of institutions in the recipient country, found that immigration is able to improve a country's institutions. In other words, a larger share of immigrants over the total population could yield positive effects on government quality.

These findings have been supported by Powell et al., (2017). The authors, indeed, pointed out that during the 1990s, the mass migration from the Soviet Union to Israel due to the exogenous shock of the relaxation in the emigration restrictions in the Soviet Union not only increased the Israel's population by 20%, but also affected the institutions in the destination country by bringing the Israel's economic freedom 15% below the global average to 12% above the same average.

Furthermore, analogous positive consequences have been also found for the destination regions. In particular, Padilla and Cahanosky (2017), for instance, in an empirical attempt to analyse the relationship between immigration and economic freedom, indicated that the naturalized US immigrants who are eligible to vote do not lead to a deterioration of the American states' institutions as suggested by Borjas (2015).

Despite less attention paid to the intra-national level, there are several advantages related to this kind of analysis at the sub-national level. First, the higher internal heterogeneity in terms of structural variables able to affect the level of institutions contributes to the rise of the importance of such intra-national perspective. Second, in an



important attempt to create new data on regional quality of government, Charron et al. (2014) have demonstrated that significant variations in terms of institutional quality within a country could lead to biased estimation in the cross-country analysis. In particular, by challenging two implicit assumptions, the authors provide evidence that sub-national differences matter more than national ones and, furthermore, by exclusively considering the 27 European countries, the authors discard the idea that the institutional differences are fairly low across similar Western democracies. Finally, the role played by human capital mobility on the quality of the institutions should be assessed considering the many dimensions of institutional quality. The relevance of such an in-depth analysis has been underlined in other works related to institutional quality and its effect on innovation and growth. For instance, Rodríguez-Pose and Di Cataldo (2015) highlight that the quality of sub-national governments and their dimensions (control of corruption, rule of law, government effectiveness and government accountability) have a strong effect on the innovative capacity of European regions by transforming the R&D investments into innovation.

However, the extant literature shows an important gap which our paper explicitly addresses. In particular, no attention has been paid so far to the consequences of intra-national, interregional migration, even though, as emphasized by Fujita et al. (1999) one of the most important elements that often distinguishes models at the regional level from those at the international level is the more intensive internal migration with respect to the cross-country mobility.

## 2.2 | Human capital and institutions

The growing importance of human capital as a crucial mechanism able to explain the relationship between migration and institutional quality raises the necessity to pay attention to the causal nexus between human capital and institutions. A consolidated literature strand, indeed, has demonstrated that a higher level of education increases citizens' ability to select the governing class and to better evaluate the political decisions. Education, indeed, represents a crucial element in increasing the dimension of the networks, cooperation and social participation, with important consequences on institutions. From an empirical perspective, Barro (1999) adds to this studies by investigating the relationship between standard of living, GDP per capita and the level of education of the resident population. The author finds, through a 1960–1995 panel data, that all of these elements exhibit a positive influence on the democracy level. Glaeser, La Porta, Lopez-De-Silanes, and Shleifer (2004), using an OLS estimator, contribute to the debate on the importance of human and social capital emphasizing that greater educational attainments of the population imply greater institutional opportunities. However, as pointed out by Acemoglu et al. (2005) the positive relationship between education and democracy found by cross-country estimations can be biased due to the problem of omitted variables which affect both education and democracy. The authors, indeed, show that the relationship between average years of schooling and democracy disappears when country fixed effects are included in the model.

However, different authors have highlighted that the findings of Acemoglu et al. (2005) can suffer from a weak identification and weak instruments problems due to the forward-looking nature of investments in human capital and the high persistence of democracy and education (Bobba & Coviello, 2007). The implementation of the System GMM estimator is able to overcome this bias by estimating a system of equations which includes the equation in first differences and the equation in levels. By applying this robust methodology, Bobba and Coviello (2007) found a positive relationship between education and democracy. Also, Fortunato and Panizza (2015), looking at the interaction between education and quality of government, find a positive relationship between the marginal effect of education on the level of governance and, thus, confirming that the level of education represents an important determinant of institutions. More specifically, if the “education enhances political engagement and participation and increases citizen's ability to make good (*ex ante*) electoral choices and to evaluate (*ex post*) the actions of elected officials” (Fortunato & Panizza, 2015 p. 334) the level of education of the electorate is positively related to the institutional performance.

In summary, there is a consolidated idea of a positive nexus between qualified, skilled and competent individuals and institutional quality. The higher level of education, indeed, can foster: (i) the ability to complain effectively, by

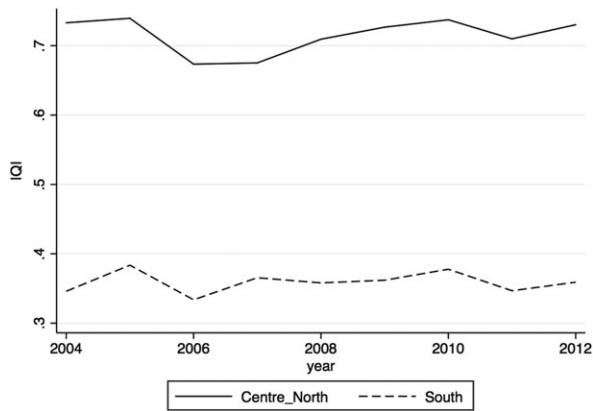


FIGURE 1 ■■

Q10

increasing the interest and the cognitive skills to be informed and (ii) the propensity of individuals towards pro-social behaviour and less tolerant actions with respect to corrupted politicians.

### 3 | DATA DESCRIPTION: INSTITUTIONS, MIGRATION AND HUMAN CAPITAL MOBILITY

As clarified, the province (NUTS 3 at the European level<sup>1</sup>) represent the territorial unit of analysis. Our data come from the dataset of Nifo and Vecchione (2014) and from the ISTAT.

The former dataset provides six indicators of institutional quality for all of the 103 Italian provinces, each of which represents the aggregation of different elementary indexes. The first indicator is “voice and accountability” which measures the ability of provincial's citizens to select the governing class as well as the degree of associations and social cooperation. The second indicator is the “rule of law” and represents the level of development of the society in terms of absence of crime, violence, tax evasion. Then, the dataset presents an index, which measures the government ability to promote the private sector (“regulatory quality”). The fourth is “government effectiveness” and refers to the quality of public services and policy implementation concerning health, waste management and environment. Finally, the extent to which the corruption affects the public function is included in the indicator named “control of corruption.” The indicators are standardized, so they vary between 0 and 1: the higher the institutional score, the better the quality of the institutions of the considered province.

The Italian case presents a history of economic and institutional disparities among the highest in Europe. Evidence of a persistent internal dualism between the Centre-North and the South has been provided (Crescenzi, Gagliardi, & Percoco, 2013; Gitto & Mancuso, 2015; Mastromarco & Woitek, 2006). Figure 1 shows that the disparities between the Centre-North and the *Mezzogiorno* are huge and persistent also in terms of institutional quality.

F1 Q5

An analogous picture emerges when the attention is turned to the single dimensions of governance. Table 1 clearly shows that the performance of the Central-Northern provinces, as for all of the several dimensions of institutions, are better than those of the Southern provinces.

T1

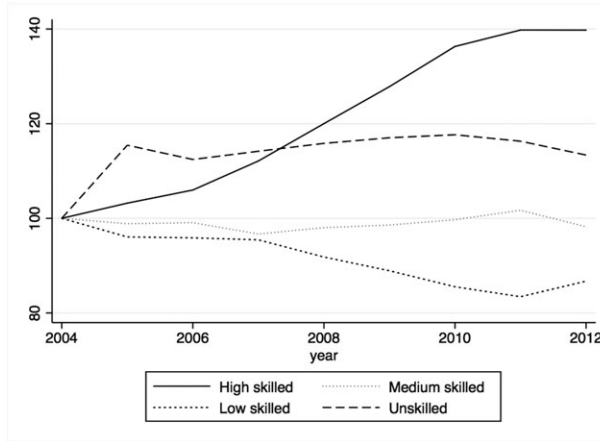
With respect to Italian interregional migration the ISTAT dataset provides five educational levels starting from the individuals without education to the tertiary educated people. In particular, by analysing the migration dynamics over the considered period, Figure 2 shows, taking the initial share of migration of 2004 equal to 100, that the evolution of the share of high-skilled mobility deviates from that of medium- and low-skilled, as well as unskilled

F2

<sup>1</sup>NUTS is the Nomenclature des Unités Territoriales Statistiques. In line with the EUROSTAT the Italian country presents 5 macro-areas (NUTS 1), 20 regions (NUTS 2) and 103 provinces (NUTS 3).

**TABLE 1** Dimensions of institutional quality index

	2004		2012	
	Centre-North	South	Centre-North	South
Corruption	0.87	0.57	0.90	0.68
Government effectiveness	0.35	0.13	0.53	0.27
Regulatory quality	0.62	0.32	0.58	0.35
Rule of law	0.67	0.46	0.66	0.47
Voice and accountability	0.50	0.25	0.55	0.29

**FIGURE 2**

individuals. This phenomenon highlights how, in Italy, the mobility is changing its characteristics with a growing weight of graduates and individuals with a college degree. The composition of these flows, indeed, has shown, during the last few years, a deep transformation from the mobility of unskilled labour force to an intellectual mobility.

Moreover, the individual decisions to re-locate, are also characterized by a main direction. Figure 3 highlights the negative net migration of the Southern provinces which is responsible for a net loss of human capital in the same provinces. In particular, the paper uses the average level of education of migration flows as a proxy of the human capital embedded in this flow of individuals. Following Barro and Lee (2001) and for the Italian context Piras (2005a, 2005b) and Fratesi and Percoco, (2014) we attribute five years for primary education, eight years for lower-secondary educated individuals, thirteen years for upper-secondary education and, finally, eighteen years for graduated.<sup>2</sup> Therefore, the in-migration and the out-migration stocks of human capital for each region  $i$  ( $HK_i$ ) are constructed separately through the following equation:

$$HK_i = \frac{\sum_k migr_k year_k}{\sum_k migr_k}, \quad (1)$$

where  $k = 1, \dots, 5$ ;  $year_k$  is the number of year of schooling for the level of education  $k$  and  $migr_k$  is the number of migrants of schooling level  $k$ . This methodology, traditionally adopted by the economic literature, represents a good approximation of the human capital content of migration when dealing with individuals of the same country.

Furthermore, in contrast to some recent studies that use data at individual level (see for instance Ciriaci, 2014; Nifo & Vecchione, 2014) this proxy allows us to analyse the entire sample of migrants by considering the human

<sup>2</sup>Individuals who have acquired at least a primary education have received 0 years of schooling.

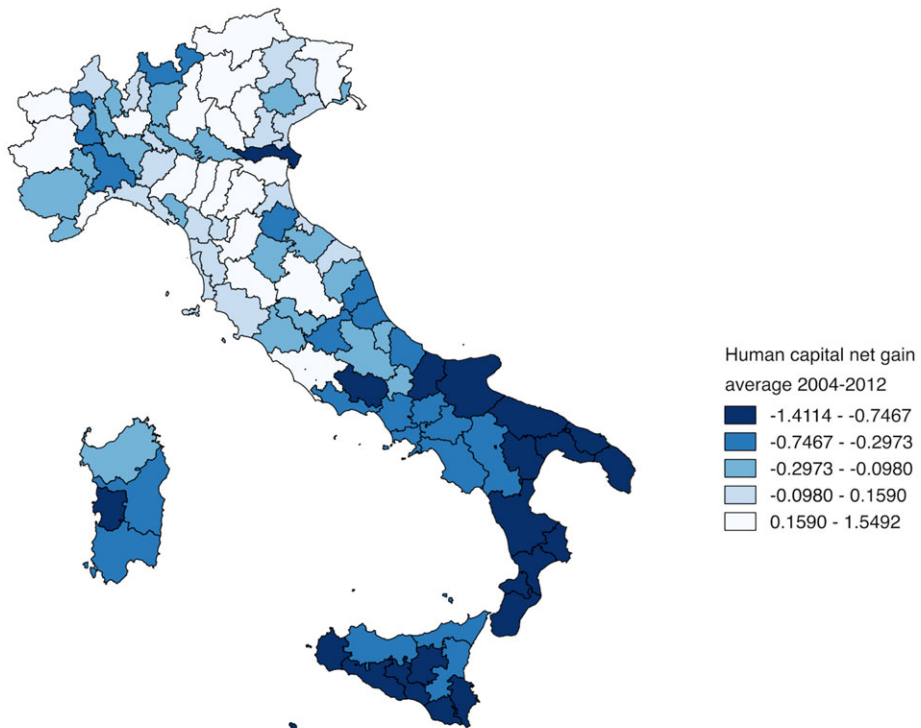


FIGURE 3 ■■

capital content of these flows. Adopting this approach, it is interesting to observe how the Southern provinces continue to register negative net migration of human capital in favour of the Central-Northern provinces (Figure 3) and, thus confirming the process of impoverishment of the *Mezzogiorno* which has lost, during the whole period, a huge number of skilled individuals and, thus, of human capital stock.

Furthermore, following Biagi, Faggian, and McCann (2011), we distinguish the long-distance mobility or the migration between provinces belonging to different macro-region,<sup>3</sup> from the short-distance migration that occurs between provinces belonging to the same macro-region. Table 2 highlights that the decision to re-locate not only occurs from the South to the Centre-North, but also among the Central-Northern provinces. As we can see in the same table, the sum of these two kinds of internal migration represents, in 2012, approximately 73% of the total migration flows. This suggests that the Italian migration is simultaneously characterized by long- and short-distance mobility. However, it is worth noticing that considering the interprovincial mobility from different regions (NUTS 1 and NUTS 2), the situation completely changes. Table 2 shows, indeed, that on average the number of migrants among Central-Northern provinces drastically decrease when we consider the interprovincial migration that presumes a change of residence, not only from a different province, but also from a different region (NUTS 1 and NUTS 2). This characteristic would encourage a deeper investigation in order to evaluate some possible heterogeneous effects of these flows that overcome the regional boundaries.

<sup>3</sup>Differently from Biagi et al. (2011) we group the interprovincial migration flows into two macro-regions, namely the Centre-North and the South. Therefore, the long-distance mobility is the migration between the South and the Centre-North.



**TABLE 2** Short and long distance migration between Italian macro-regions (Centre-North and South)

	2004		2012	
	Migrants	Share	Migrants	Share
Among Central-Northern provinces	215,733	0.48	246,727	0.49
From different regions (NUTS 2)	100,999	0.23	109,438	0.22
From different macro-areas (NUTS 1)	58,784	0.13	62,703	0.12
South to Centre-North	111,476	0.25	119,030	0.24
Among Southern provinces	57,480	0.13	76,352	0.15
From different regions (NUTS 2)	18,903	0.04	23,286	0.05
From different macro-areas (NUTS 1)	6,676	0.01	6,916	0.01
Centre-North to South	63,799	0.14	62,630	0.12
Total interprovincial mobility	448,488	1	504,739	1

## 4 | EMPIRICAL ANALYSIS

### 4.1 | Econometric issues

In this section, the relationship between internal migration and institutional quality as well as the role of human capital is tested through a panel data econometric model (the descriptive statistics are in Table 3). Starting with the first T3 specification that considers the impact of net-migration, the model is formulated as follows:

$$I_{i,t} = \beta_1 I_{i,t-1} + \beta_2 \text{net\_tot}_{i,t-1} + \gamma_1 \text{wserm}_{i,t-1} + \gamma_2 \text{open}_{i,t-1} + \gamma_3 \text{fraction}_{i,t-1} + \gamma_4 \text{popdens}_{i,t-1} + \mu_i + \eta_t + \varepsilon_{i,t}, \quad (2)$$

where  $i = 1, 2, \dots, 103$  is the province and  $t = 2004, 2008 \dots 2012$  is the time period covered by the data,  $\varepsilon_{i,t}$  is the idiosyncratic error term and  $I_{i,t}$  represents the six dimensions of institutions while  $I_{i,t-1}$  is the initial level of institutional quality which allows us to consider the persistence of institutional quality. The model includes all the time effects ( $\eta_t$ ) and the provincial time-invariant characteristics ( $\mu_i$ ). Some control variables are included in the regression:  $\gamma_1$  is the

**TABLE 3** Descriptive statistics of the variables

Variable	Description	Obs.	Mean	Std. Dev.	Min	Max
iqi*	institutional quality index	927	0.58	0.218	0	1
corruption*	control of corruption	927	0.82	0.165	0	1
government*	government effectiveness	927	0.36	0.177	0	1
regulatory*	regulatory quality	927	0.48	0.208	0	1
ruleoflaw*	rule of law	927	0.57	0.201	0	1
voice*	voice and accountability	927	0.40	0.165	0	1
net_tot	$\left( \frac{\text{immigration}_{it} - \text{outmigration}_{it}}{\text{population}_{it}} \right) \cdot 1000$	927	0.23	2.427	-7.42	6.51
net_hk	$\text{HK}_{IN, it} - \text{HK}_{OUT, it}$	927	-0.24	0.656	-1.92	1.91
wserm	share of employees in market services	927	0.38	0.047	0.26	0.54
open	share of import and export over GDP	927	0.22	0.166	0.04	1.35
fraction	$\left( \frac{\text{foreign-born}_{it}}{\text{population}_{it}} \right) \cdot 1000$	927	37.71	14.514	5.91	75.77
pop_dens	number of individuals per square kilometer	927	245.54	326.477	37.27	2603.16

Note: \*for further details on the methodology see Nifo and Vecchione (2014)



coefficient associated to the share of market services (*wserm*),  $\gamma_2$  is the parameter related to the degree of openness (*open*),  $\gamma_3$  is the coefficient associated with ethnic fractionalization (*fraction*) and, finally,  $\gamma_4$  is the parameter related to the population density (*popdens*).

Moreover, the possibility to observe the level of education of each migrant allows us to test the impact of migration once the human capital content is considered. In this case the model is structured as follows:

$$l_{i,t} = \beta_1 l_{i,t-1} + \beta_2 net\_hk_{i,t-1} + \gamma_1 wserm_{i,t-1} + \gamma_2 open_{i,t-1} + \gamma_3 fraction_{i,t-1} + \gamma_4 popdens_{i,t-1} + \mu_i + \eta_t + \varepsilon_{i,t}, \quad (3)$$

where *net\_hk* represents the human capital net gain proxied through the average years of schooling. The regression analysis focuses on the impact on each different dimension of institutions (voice and accountability, government effectiveness, regulatory quality, rule of law, control of corruption and, finally, the overall synthetic indicator).

The simultaneous presence of highly persistent variables – such as institutional quality and human capital, highly path dependent – of unobservable heterogeneity and of some potential endogeneity among the explanatory variables, creates a systematic distortion (Bobba & Coviello, 2007; Castelló-Climent, 2008), so the adoption of a static panel approach, such as fixed-effects or random-effects, could lead to biased estimated coefficients.

In order to remove the time-invariant provincial characteristics and to solve this simultaneity bias (Anderson & Hsiao, 1982) an econometric strategy which consists in first-differencing the equations and then searching for instrumental variables (IV) is often adopted. In this transformation, explanatory variables dated before  $t-1$  can be used as valid instruments. However, the presence of the lagged level of institutions ( $l_{i,t-1}$ ) among the explanatory variables raises the need to instrument both the lagged dependent variable and the other endogenous variables.

Arellano and Bond (1991) propose a generalization of the method suggested by Anderson and Hsiao (1982) by instrumenting the first-differences of the endogenous explanatory variables with a set of lagged levels of the same explanatory variables. Arellano and Bover (1995) and Blundell and Bond (1998) extend this technique by adding the equation in levels to the equation in first difference, where the instrument of the endogenous regressors are the lagged differences of the same variables. The SYS-GMM is able to account for the dynamics of the data generation process, measurement errors, unobserved heterogeneity and endogeneity. Moreover, as pointed out by some authors (Bobba & Coviello, 2007; Castelló-Climent, 2008; Li et al., 2016), when we are in the presence of highly persistent variables, such as institutions that are highly path dependent, the SYS-GMM has proved to perform better than the first-difference estimator.

Finally, the internal instruments of the SYS-GMM estimator also give the possibility to consider each control variable (share of market services, trade openness, ethnic fractionalization and population density) as potentially endogenous. However, it is a well-known fact, that when the number of instruments becomes large, the estimation accuracy decreases. Roodman (2009) indicates that a large number of instruments reduces the power of test of over-identifying restrictions. In particular, the same author proposed to keep the number of instruments lower than a maximum threshold given by the number of units: in our case, the 103 Italian provinces. In order to avoid a different lag structure for each specification, and in line with previous works (Docquier et al., 2016; Spilimbergo, 2009) all the explanatory variables are treated as predetermined and endogenous and instrumented with their first to third lags. As a result, the paper aims to estimate the relationship between human capital mobility and the quality of institutions by implementing a SYS-GMM.

The validity of moment conditions is tested by implementing the Hansen's J test of over-identifying restrictions and the Arellano-Bond test for serial correlations of the error term.

## 4.2 | Econometric results

Our approach follows three conceptual steps. We first estimate the relationship between net migration and the overall index of institutional quality (*iqi*). Second, we consider the human capital content of net migration flows. Finally, we estimate the Equation 3 for all five dimensions of institutions.



The findings related to the first specification are reported in the first column of Table 4. The effect of the total net migration rate (*net\_tot*) on the level of institutional quality is not statistically significant. When the skill level is added into the analysis and the total migration rate is replaced with a measure of the human capital net gain (*net\_hk*), the related coefficient is statistically significant and positive (column (2)), which is consistent with the findings in other studies focused on the relationship between education and institutions (Bobba & Coviello, 2007; Castelló-Climent, 2008; Li et al., 2016). In particular, the province that attracts human capital improves the overall quality of government by stimulating a process of skills accumulation. On the contrary, the loss of human capital, besides reducing the intensity of skilled individuals, contributes to reducing the institutional quality of a province. In other words, a negative human capital net gain has a negative effect on the quality of institutions.

This result is very relevant in a context like the Italian one, characterized by huge interprovincial migration flows from the poor to the rich provinces or from the South to the Centre-North. Since the skill intensity embodied in the migration flows contributes to modify the regional distribution of human capital, human capital mobility ends up increasing the provincial skill disparities, with a diverging impact on institutional quality.

Both the models include a lagged dependent variable. The positive and statistically significant coefficients demonstrate that provinces with higher quality of government tend to show better institutional performance in the next period and, thus, a persistence of institutional quality over time. A 0.7203 coefficient for the lagged level of institutional quality index (*iqi*) means that, in presence of an exogenous shock, it takes 2 periods to fill half of the gap with the long-run level of government quality.<sup>4</sup>

With respect to the coefficients associated to the control variables, first, provinces that have registered structural change through an increase in the share of employees in the market services have obtained substantial benefits in terms of institutional quality. Government quality, indeed, is affected by the innovative capacity of a province (Rodríguez-Pose & Di Cataldo, 2015) and, in particular, a more innovative productive structure towards services with an intense use of information and communication technologies (ICT), such as knowledge-intensive business services, positively boosts the level of institutions. Furthermore, a greater degree of openness positively affects the institutional quality of a province as highlighted by the positive coefficient associated with the degree of openness. The literature, indeed, has widely demonstrated the strong correlation between good institutions and trade openness (measured as the sum of imports and exports over the GDP) (Docquier et al., 2016; Rodrik, Subramanian, & Trebbi, 2004). Moreover, the positive impact related to the ethnic fractionalization on the level of institutional quality could create an interpretation problem between who argues that the different institutional dimensions are inversely related to the foreign-born population and those who affirm the positive correlation between them by considering that societies more tolerant and democratic tend to present higher level of ethnic fragmentation (Alesina, Devleeschauwer, Easterly, & Kurlat, 2003). Our results seem to show, at least at the provincial level, the validity of a positive relationship between good institutions and ethnic fractionalization.

Finally, by controlling for the population density, the coefficients associated with this variable seem to have a negative effect on the overall institutional quality index (*iqi*) even with the low magnitude of the impact.

The third step of our analysis focuses on the effects of human capital mobility on each of several dimensions of the institutional quality (columns (3)–(7)), which allows a more refined investigation, and even more consistent with the distinction between *political* and *economic* institutions typically carried out in the literature. The dataset provided by Nifo and Vecchione (2014) include the following dimensions: *corruption*, government effectiveness (*government*), regulatory quality (*regulatory*), *rule of law* and voice and accountability (*voice*). Except for the *government effectiveness*, human capital net gains have a positive and statistically significant effect on each institutional dimension, though with different magnitudes. The highest coefficients are associated with the impact on the level of corruption (0.0664) and on the regulatory quality (0.0545) which represent the most important indicators of the *economic* institutions. On the other hand, the effect is lower when analysing the role of human capital net gain on the variables mainly

<sup>4</sup>As in Docquier et al. (2016) we calculate the number of periods necessary to close a  $x$  percent of the gap between the current level of governance and the steady state through the following equation:  $-\lceil \ln(1 - x)/(1 - \beta) \rceil$ .

**TABLE 4** Estimation results

Variables	iqi (1)	iqi (2)	Corruption (3)	Government (4)	Regulatory (5)	Rule of law (6)	Voice (7)
L.dependent	0.8016*** (0.0301)	0.7203*** (0.0356)	0.1913** (0.0957)	0.7792*** (0.0516)	0.3968*** (0.0487)	0.6704*** (0.043)	0.7777*** (0.056)
net_tot	0.0033 (0.0028)						
net_hk		0.0491*** (0.0124)	0.0664*** (0.022)	-0.0099 (0.0129)	0.0545** (0.0213)	0.0260** (0.0115)	0.0278*** (0.0093)
wserm	0.7798*** (0.1606)	0.7439*** (0.1913)	1.0514*** (0.3018)	0.8745*** (0.2289)	0.6889** (0.2788)	0.0935 (0.2446)	0.7227*** (0.1968)
open	0.1068*** (0.0403)	0.0974** (0.0389)	0.1452** (0.0717)	0.1401* (0.073)	0.2843*** (0.0344)	0.0777** (0.0337)	0.1175*** (0.0409)
fraction	0.0006*** (0.0002)	0.0009*** (0.0002)	0.0015** (0.0006)	-0.0003 (0.0002)	-0.0001 (0.0005)	0.0014*** (0.0004)	0.0003 (0.0002)
pop_dens	-0.0002*** (0.0000)	-0.0001*** (0.0000)	-0.0003*** (0.0000)	0.0002 (0.0000)	-0.0001*** (0.0000)	0.0001 (0.0000)	-0.0003** (0.0000)
constant	-0.2191*** (0.0596)	-0.1523** (0.0728)	0.2587** (0.1138)	-0.2543*** (0.0791)	0.0011 (0.1124)	0.0974 (0.0953)	-0.2003*** (0.0621)
NxT	824	824	824	824	824	824	824
N	103	103	103	103	103	103	103
First-order autocorrelation	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Second-order autocorrelation	0.595	0.505	0.421	0.163	0.952	0.134	0.137
Hansen's J test	0.195	0.213	0.202	0.209	0.222	0.202	0.229

Notes: \*\*\*statistically significant at the 1%; \*\*statistically significant at 5%; \*statistically significant at 10%. Standard errors clustered by province (NUTS 3) are in parentheses.



representative of the *political* institutions, in our case proxied by the efficiency of justice (rule of law) and by the ability of the citizens to select the governing class (voice and accountability).

The highest coefficient for the lagged dependent variable is associated with the government effectiveness. A value of 0.7792 implies that it takes 3 years to fill half of the gap with the long-run level. Furthermore, as in the previous models, we control for the specific provincial characteristics that have been shown to contribute to determining the institutional quality. Although the coefficients for all the control variables show the expected signs, the coefficients related to the population density and to the ethnic fractionalization are not always statistically significant. In particular, the population density seems to have a significant negative effect only on the control of corruption, on the regulatory quality and on the voice and accountability, while the ethnic fragmentation exerts a positive impact on the level of corruption and the rule of law.

Standard errors are robust and clustered by province. All the explanatory variables are treated as predetermined and instrumented with their first to third lags. The estimates are robust. Since the model is over-identified, we use the Hansen's J test in order to verify the validity of the instruments. Moreover, the test on serial autocorrelation is also carried out. The former indicates that the null hypothesis cannot be rejected at 10% (the instruments are valid) while the latter shows that although first-order autocorrelation is expected, the test of second-order autocorrelation presents an absence of a higher-order autocorrelation in the GMM model.

### 4.3 | Robustness by sub-sample

The previous results provide a useful summary of the relationship between human capital mobility and institutional quality across the Italian provinces. However, as pointed out in the descriptive section, great attention must be paid to the direction of human capital mobility, as a relevant share of migrants moves not only from the South of the country to the Central-Northern provinces, but also among the Central-Northern provinces. By looking at the number of individuals who migrate within the same NUTS 2 region, the share over the total interprovincial migration is equal to 34% and this percentage increases to 46.3% when we consider the share of interprovincial mobility within the same NUTS 1 macro-area. Given the importance of this internal movement and the ability of intra-regional human capital mobility to modify the spatial distribution of skills it seems to be important to separate the interprovincial mobility.

In this section, we conduct two sets of robustness check. In particular, we aim at evaluating whether and to what extent there is a difference in the estimated relationship between human capital mobility and quality of institutions once we consider a set of individuals who not only change the province of residence but also the region and then the macro-area of residence. In other words, we re-estimate this relationship by considering the interprovincial migration that presumes a change of residence from a different region (NUTS 1 or NUTS 2) and, thus, neutralising the effects related to the intra-regional mobility. The rationale for doing this is that short and long distance mobility could be driven by different factors. In a recent empirical work on the causes of short and long distance migration in Italy, Biagi et al. (2011) conclude that for the long distance mobility from the lagged and poorer provinces of the South to more industrialized Northern provinces, the differences in terms of economic opportunities between them play a key role. Otherwise, the aspects mainly related to the quality of life are more relevant for short distance mobility within the same macro-regions. Nevertheless, both the short and the long distance mobility could have the same effect on the spatial redistribution of human capital.

Starting with the sample of individuals who change their region of origin (NUTS 2), the results are reported in Table 5. The coefficients of the human capital net gain, except for the level of corruption, are always positive and statistically significant. These results, confirm the previous finding by indicating that a positive human capital net gain is associated with better quality of institutions while on the other hand, when the net human capital mobility decreases, the reduction of education that follows has a negative effect on the quality of provincial governance.

Even in this case, the coefficients related to the control variables show the expected sign and are statistical significant.

Our conclusions are qualitatively unchanged even when we consider the interprovincial migration that presumes a change of residence from different macro-areas. Table 6 shows that human capital net gains promote the


**TABLE 5** Estimation results from different regions NUTS 2

Variables	iqi (1)	Corruption (2)	Government (3)	Regulatory (4)	Rule of law (5)	Voice (6)
L.dependent	0.7091*** (0.036)	0.1475*** (0.0923)	0.7857*** (0.0506)	0.4164*** (0.0479)	0.6553*** (0.0443)	0.7756*** (0.0534)
net_hk_region <sup>a</sup>	0.0392*** (0.0078)	0.0562*** (0.0149)	-0.0042 (0.0088)	0.0312** (0.0147)	0.0220*** (0.0076)	0.0195*** (0.0059)
wserm	0.7270*** (0.1855)	1.1332*** (0.2865)	0.8236*** (0.2128)	1.1566*** (0.2802)	-0.0414 (0.2367)	0.7459*** (0.19699)
open	0.0999*** (0.0344)	0.1447** (0.0678)	0.1338* (0.0724)	0.2810*** (0.039)	0.0713** (0.0344)	0.1180*** (0.0425)
fraction	0.0009*** (0.0002)	0.0015** (0.0006)	-0.0003 (0.0002)	-0.0002 (0.0005)	0.0014*** (0.0004)	0.0002 (0.0002)
pop_dens	-0.0001*** (0.0000)	-0.0003*** (0.0000)	-0.0001 (0.0000)	-0.0001*** (0.0000)	0.0002 (0.0000)	-0.0003* (0.0000)
constant	-0.1410** (0.0708)	0.2665** (0.1099)	-0.2342** (0.0735)	-0.1820* (0.1009)	0.1566* (0.0934)	-0.2102*** (0.0629)
NXT	824	824	824	824	824	824
N	103	103	103	103	103	103
First-order autocorrelation	0.000	0.000	0.000	0.000	0.000	0.000
Second-order autocorrelation	0.5858	0.065	0.1578	0.9779	0.187	0.082
Hansen's J test	0.222	0.213	0.215	0.206	0.21	0.231

Notes: \*\*\*statistically significant at the 1%; \*\*statistically significant at 5%; \*statistically significant at 10%. Standard errors clustered by province (NUTS 3) are in parentheses.

<sup>a</sup>The human capital net gain includes the interprovincial mobility from a different region (NUTS 2).



**TABLE 6** Estimation results from different macro-area NUTS 1

Variables	iqi (1)	Corruption (2)	Government (3)	Regulatory (4)	Rule of law (5)	Voice (6)
L.dependent	0.7007*** (0.0387)	0.1355*** (0.0896)	0.7792*** (0.0512)	0.3981*** (0.0487)	0.6578*** (0.0469)	0.7808*** (0.0542)
net_hk_macro <sup>b</sup>	0.0342*** (0.0074)	0.0476*** (0.0123)	-0.0062 (0.0078)	0.0293** (0.0123)	0.0211*** (0.007)	0.0167*** (0.0053)
wserm	0.6758*** (0.1821)	1.1700*** (0.2851)	0.8467*** (0.2289)	1.0341*** (0.2981)	-0.0873 (0.2386)	0.7080*** (0.1868)
open	0.0941*** (0.0364)	0.1417** (0.079)	0.1367* (0.0699)	0.2818*** (0.0401)	0.0662* (0.035)	0.1132*** (0.0409)
fraction	0.0010*** (0.0002)	0.0016** (0.0006)	-0.0002 (0.0002)	-0.0001 (0.0005)	0.0014*** (0.0004)	0.0003 (0.0002)
pop_dens	-0.0000*** (0.0000)	-0.0003*** (0.0000)	0 (0.0000)	-0.0001** (0.0000)	0 (0.0000)	-0.0000*** (0.0000)
constant	-0.1225* (0.0712)	0.2569** (0.1064)	-0.2433*** (0.079)	-0.1324 (0.1091)	0.1709* (0.0987)	-0.1995*** (0.0594)
NXT	824	824	824	824	824	824
N	103	103	103	103	103	103
First-order autocorrelation	0.000	0.000	0.000	0.000	0.000	0.000
Second-order autocorrelation	0.6817	0.0942	0.1673	0.9151	0.182	0.0561
Hansen's J test	0.205	0.206	0.205	0.203	0.199	0.26

Notes: \*\*\*statistically significant at the 1%; \*\*statistically significant at 5%; \*statistically significant at 10%. Standard errors clustered by province (NUTS 3) are in parentheses.

<sup>b</sup>The human capital net gain include the interprovincial mobility from different macro-area (NUTS 1).



institutional quality through four main channels: reducing the level of corruption, increasing the ability to promote the private sector, reducing the level of tax evasion and, finally, with a positive effect on the citizen's ability to select the governing class.

In summary, once we eliminate the effect on the human capital redistribution due to intra-regional mobility the results remain qualitatively the same and the skilled-migration continues to exhibit important consequences on the quality of government.

## 5 | CONCLUSIONS

The importance of institutions for the long-run economic growth has raised the interest of the literature on the mechanisms able to affect the institutional development. Among these factors, the human capital mobility plays a key role. A higher level of education increases the dimension of networks, social cooperation and participation, as well as the ability to select and to evaluate the governing class through a more informed electorate. However, the difficulties that arise to measure the institutional quality at regional level have led to an absence of empirical contributions on the impact of the interregional mobility of skilled individuals on institutional outcomes. The extant literature has been entirely focused on international migration, demonstrating the beneficial effect for the sending and receiving country.

By using a System GMM estimator to account for provincial-specific effects, for the presence of highly persistent variables and for the endogeneity of the human capital mobility, the present paper contributes to the literature by empirically investigating the relationship between net-migration and institutional quality and the role of human capital mobility across the Italian provinces during the time period 2004–2012 with the aim of extending the results to other national contexts through innovative features.

The results, depicted in the present paper, could be seen from two complementary perspectives. First, in line with the economic literature, the descriptive analysis has shown a selective migration towards the most skilled individuals from the Southern provinces to Central-Northern ones with an impoverishment of the South which has lost, during the whole period, a huge number of qualified people. In particular, migrations, gradually characterized with an increasing share of skilled individuals, are widening the average skill intensity in the richer provinces.

Second, the main outcome related to the econometric results confirm the important effects of the human capital mobility on the institutional quality. In particular, when the skill level is added into the analysis and the total migration is replaced with a measure of the human capital net gain, the mobility of skilled individuals seems to have important consequences on the overall institutional quality. The findings show that a higher human capital net gain has a positive impact on the quality of institutions of Italian provinces highlighting that the ability to attract human capital plays a key role on regional strategic policies. In the following years, indeed, the economic competition and the ability to increase the opportunities of a sustainable and durable economic growth will be based on the capacity of attracting human capital.

Moreover, we find interesting results when we investigate the effect of skilled migration on all the different dimensions of institutions: corruption, government effectiveness, regulatory quality, rule of law and voice and accountability. More specifically, except for the government effectiveness, the paper provides evidence of a significant and positive effect on each dimension of institutions even though the magnitude of the coefficients associated to the net human capital mobility differs among the different dimensions of quality of government.

Given the significant consequences of the interprovincial mobility on institutional quality, the present findings add to the existing economic literature interested in the effects of international migration on the government quality, by suggesting that the analysis of intra-national, interregional flows can contribute to understand the relationship between migration and institutional quality. In other words, the paper sheds light on the importance of enriching the economic debate with new evidences rather than from an international perspective, through an investigation of the cross-country mobility effects, from an internal point of view through an analysis of the interregional migration where, to the best of our knowledge, this is the first attempt in literature.





In summary, if the vast majority of works have highlighted that the different human capital endowments could be a crucial factor able to explain the disparities in terms of economic growth, the present paper adds to this literature by giving evidence that human capital mobility significantly affects one of the most important source of economic growth, the institutions and its components. This is even more important, if the intra-national, interregional human capital mobility follows an asymmetric and unbalanced direction from the South to the Centre-North. This process, indeed, by modifying the regional human capital distribution, is able to explain the persistent institutional disparities between these two macro-areas of the country.

We strongly believe that this analysis can shed light, through new empirical evidence, on better understanding the potential effects resulting from the relationship between migration, skill intensity and institutional quality. Nevertheless, the results presented in this paper provide a possible direction for future research. It might be interesting to investigate the channels through which the relationship between migration, institutions and economic growth is expressed with the aim to examine the potential direct and indirect effects of migration on economic disparities.

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