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# THE EFFECT OF SKILLED MIGRATION ON INSTITUTIONAL QUALITY OF ITALIAN PROVINCES.

Claudio Di Berardino<sup>1</sup>, Dario D'Ingiullo<sup>2</sup>, Davide Quaglione<sup>3</sup> and Alessandro Sarra<sup>4</sup>

### Abstract:

The paper aims at investigating the relationship between internal migration and institutional quality across the Italian provinces. In most studies, the potential determinants of migration have been investigated, while the effect of these flows of individuals has received less attention. In particular, within the migration literature focused on the consequences of migration, there is a larger gap concerning the relationship between migration and institutions. Using a panel data during the time period 2004-2012, the authors tested if the human capital mobility had an effect on institutional quality and its components (control of corruption, government effectiveness, regulatory quality, rule of law and voice and accountability). In order to control both the issue of endogeneity and the bias due to omitted variables, the paper implements a system GMM estimator. The findings show that human capital in-flows have a positive impact on the quality of institutions of Italian provinces. On the contrary, the loss of human capital, contributes to reduce the institutional quality of a province. However, the results vary across the different dimensions of institutions, indeed, the main channels through which the human capital mainly affect institutions seem to be the level of corruption the regulatory quality and the rule of law. Furthermore, the paper demonstrates how the human capital mobility contributes to increase the internal dualism between the Centre-North and the 'Mezzogiorno' also in term of institutions.

<sup>&</sup>lt;sup>1</sup> Department of Management and Business Administration, University of G. d'Annunzio, Chieti-Pescara, viale Pindaro 42, email: c.diberardino@unich.it

<sup>&</sup>lt;sup>2</sup> Department of Economics, University of G. d'Annunzio, Chieti-Pescara, viale Pindaro 42, email: dario.dingiullo@unich.it

<sup>&</sup>lt;sup>3</sup> Department of Economics, University of G. d'Annunzio, Chieti-Pescara, viale Pindaro 42, email: d.quaglione@unich.it

<sup>&</sup>lt;sup>4</sup> Department of Economics, University of G. d'Annunzio, Chieti-Pescara, viale Pindaro 42, email: sarra@unich.it

#### 1. Introduction

During the last few decades the economic literature has shown a growing interest both on the importance of institutions for economic development (Acemoglu et al., 2005a; Rodrik, 2007; Rodríguez-Pose, 2013) and on the relationship between human capital and institutions (Glaeser, 2004; Acemoglu et al., 2005b). Furthermore, in an era when the human capital mobility is becoming more intensive (over 20 million high-skilled individuals who live in the OECD area are migrants) the attention, from both researchers and policymakers, is paid on the consequences of the high-skilled mobility on government quality. The institutions represent the "rules of the game in a society; (and) more formally, (as) the humanly devised constraints that shape human interaction" (North, 1990 p. 477). Acemoglu et al. (2005a) contributes to this definition by operating a distinction between *economic* and *political* institutions. While the former affect the technological change, the organization of production and physical and human capital accumulation, the latter includes the *de jure* political power and the *de facto* political power. The literature shows that countries and regions with high institutional quality have been more successful in adopting frontier technology and productivity since the turn of the millennium.

In this paper, by making use of recently available datasets, the relationship between human capital mobility and the quality of institutions is tested. The institutional quality is a broad concept that captures law, individual rights and high quality government regulation and services.

The empirical literature has demonstrated the presence of several channels through which the skilled individuals could affect the institutional quality. Li and McHale (2006) describe these channels by separating the impacts on political institutions or the set of collective decisions and, thus the democracy level, from those on economic institutions or the legal structure able to provide public goods and services. The authors found that the final effect of human capital mobility is ambiguous and depends on the magnitude of each different channel. Barro (1999) and Glaeser et al. (2004), for instance, show that the differences of human capital endowment, besides affecting the level of democracy, are also able to explain the disparities in terms of economic growth.

However, all of these studies are focused on the effects of international migration on institutional quality by considering the country as unit of analysis. The literature, indeed, beyond having demonstrated the importance of skilled individuals in explaining the institutional quality and the existence of feedback from emigration to the origin place, present a gap concerning the potential effect on institutional quality of these flows of individuals at the regional level. Moreover, different authors have demonstrated the increasing role of institutions for the regional development that in most cases is greater than those related to the traditional factors such as human and physical capital (Acemoglu et al. 2001). Streeck (1991) and Rodríguez-Pose (1999) shed light on the positive relationship between the regional institutional composition and the dynamic of growth by affirming that the organization abilities of institutions work better at the regional level with respect to the national scale where institutions are "too distant, remote and detached in order to be effective in mobilizing organizations" (Rodríguez-Pose, 2013 p.1037)

Given the recognized importance of institutions as a key factor to promote regional growth and the capability of human capital to promote institutional quality, the present paper attempts to fill the literature gap by exploring if and to what extent the flows of skilled individuals have an effect on the quality institutions once we control for a number of important variables (degree of regional openness and the ethnic fractionalization) that have been shown to determine institutions (Spilimbergo, 2009; Beine and Sekkat, 2013; Doquier et al., 2016).

The econometric analysis is carried out by merging the ISTAT's dataset on bilateral migration flows by educational level among the Italian provinces during the period 2004-2012 and the dataset of 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 a particular dimension of institutions according to the definition proposed by Kaufmann et al. (2010). For what concern the human capital mobility, the paper implements, as a proxy of the skills content of migration flows, the average years of schooling (Dolado, 1994; Fratesi and Percoco, 2014). This methodology allows us to quantify the human capital embedded in these flow of individuals.

The massive brain drain from the Southern regions to the Central-Northern regions and the persistent internal economic and institutional dualism between the Centre-North and the "Mezzogiorno" make the Italian case an interesting national context to analyse. Fratesi and Percoco (2014) point out the contribution

of migration to the human capital accumulation in the host region. The underlying idea is that migration affects the destination place by not only increasing its labour force, but also changing the way human capital is distributed and, as a consequence, the economic performance.

This kind of investigation has several 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, the literature has demonstrated how the institutional quality represents an important determinant of migration which is included into the human capital decision to re-locate (Nifo and Vecchione, 2014; Ariu et al., 2016). Second, the vast majority of empirical works are not able to measure the human capital endowment of migration. Finally, Acemoglu et al. (2005b) highlight how, in this context, the relationship between education and institutions could be driven by omitted factor able to affect both the variables. Therefore, a pooled cross-sectional regression could lead to biased estimation results.

The present paper is simultaneously able to investigate the role of human capital mobility on institutional quality and to account for all the previously discussed issues. The analysis is carried out by implementing a dynamic panel data econometric model and, in particular, a system GMM of (Blundell and Bond, 1998) in order to account for both the endogeneity issues and the time-invariant provincial characteristics. Furthermore, with respect to skill selectivity, the ISTAT's dataset provides a subdivision of migration flows in terms of educational level, which enables us to disentangle the different migrant's skills by using the level of education of migration flows. This subdivision gives us the possibility to quantify the human capital embedded in the migration flows through a weighted average of each kind of flow and the relative number of years of schooling necessary to achieve the corresponding level of education. In this way the human capital stock is proxied by the average number of years of schooling (Dolado, 1994; Fratesi and Percoco, 2014).

The remainder of the paper is organized as follow. Section 2 provides the literature empirical background. In section 3 and 4, the descriptive analysis and econometric model will be specified and the results will be presented. Finally, in the last section, we provide the main conclusions of the analysis.

#### 2. Migration and Institutions: a general assessment

There is a large consensus concerning the role of institutions as a crucial factor able to affect the economic development in modern economies. Different studies have defined the institutions as an important source of economic growth through their ability to influence the technological innovations.

In line with these theoretical considerations, Barro (1997) found that the level of governance represents an important driver able to explain the economic disparities among countries. Moreover, the institutions exert a key role as a joining link between R&D investment and economic growth. The growing importance of institutions has raised the interest of scholars about the mechanisms able to improve the quality of governance. In particular, greater attention was paid to the link between human capital endowment and institutions. Barro (1999), indeed, adds to this literature by investigating the relationship between standard of living, gdp per capita and the level of education of the resident population. The author found, through a panel data over the period 1960-1995, that all of these elements exhibit a positive influence on the democracy level. Glaeser et al. (2004) contribute to the debate on the importance of human and social capital of a given country by affirming that the greater the educational attainment of the population is, the greater the institutional opportunities are.

Furthermore, beyond having demonstrated the essential role of institutions as a source of economic growth and the contribution of human capital accumulation to the growth of institutions (Acemoglu et al., 2005b; Rodrik, 2007; Rodríguez-Pose, 2013), the economic literature has also considered the human capital mobility an important determinant of institutions.

In particular, in a seminal empirical study on this topic, Spilimbergo (2009) investigates the consequences on democracy of return migration. The author analyses the effect of a sample of individuals, which have attained their education abroad, on the institutions of their home country. The results explain that foreign-educated individuals promote democracy in their home country, but only if the education is acquired in countries with high level of democracy.

Also Chauvet and Mercier (2014) are interested in the effect of return migration on their country of origin. In particular, they explore the relationship between return migration and the transfer of political norms, which is 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.

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

Another important contribution to this kind of literature is provided by Beine and Sekkat (2013). The authors examine two different effects of international migration on home country institutions. They analyse both the impact of emigration on the quality of institutions and consequently they try to find if and to what extent the emigration contributes to the transfer of norms between host and home country. The results depict 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 that is 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.

By using data at individual level, Mahmoud et al. (2013) investigate how the diffusion of knowledge through the migration process affected the political preferences in Moldova. The effect on institutions, measured in terms of electoral outcomes, is strongly related to the emigration episodes that took place from the beginning of the 1990s. It could be carefully argued that the diffusion of ideas and social norms through the pattern of international migration and human interaction is able to affect the evolution institutions. Nowadays, this process is reinforced by the globalization of the world economy that has facilitated flows of people, flows of ideas and in particular the so-called "social remittances".

Finally, Li et al. (2016) distinguish the mobility effects of the most skilled individuals on 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, all of these studies were interested in investigating, in different ways, the effects of international migration on institutional quality of the country of origin. On the contrary, even with the growing attention paid to the sub-national level dynamics, to the best of our knowledge, there is no evidence provided in literature on the effect of interregional human capital mobility on the quality of institutions. Charron et al. (2014) have demonstrated how the analysis at national level could be biased due to the significant variations in terms of institutional quality within the country and, as a consequence, the measures at national scale can overestimate the low-performing regions and underestimate the high-performing regions. Moreover, Rodríguez-Pose and Di Cataldo (2015) highlighted how the sub-national quality of government and its 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. "Quality of government thus shapes the set of constraints and incentives for regional actors to perform technical innovation, affecting, in turn, the capacity to transform public R&D policies into innovation" (Rodríguez-Pose and Di Cataldo, 2015 p. 674).

#### 3. Migration flows and human capital mobility

The difficulties of an analysis at provincial level most likely arise both to measure the quality of governance at provincial level and to compare the results with other national contexts. Fortunately, the dataset of Nifo and Vecchione (2014) measures different dimensions of institutional quality at the provincial level (NUTS3) in terms of voice and accountability, government effectiveness, regulatory quality, rule of law, and control of corruption.

The Italian case is particularly interesting for three reasons. First, the provincial inequality is among the highest in Europe and reflects a persistent internal dualism between the Centre-North and the South (Crescenzi et al., 2013; Gitto and Mancuso, 2015; Mastromarco and Woitek, 2006); Secondly, as pointed out by Fratesi and Percoco (2014), the human capital mobility contributes to increasing the Italian economic disparities by enriching the Central-Northern regions with an out-flow of skilled individual from the South of

the country. Finally, the empirical evidence has highlighted how this process of selective migration is reinforced by the differences between the two Italian macro-areas in terms of institutional quality, criminality rate and university quality (Etzo, 2008; Ciriaci, 2014; Nifo and Vecchione, 2014). In particular, among the migration choice, Dotti et al. (2014) specify how the university students (in Science and Technology) leave the Southern regions to study in the Northern universities with a more efficient labour market.

As mentioned in the introduction, the data on migration are obtained from the Istat. This data allows us to know the number of individuals who change their residence and are collected with an annual frequency which give us the advantage to examine the short term patterns of migration that are impossible to identify in other official statistics (census data) and that makes this typology of information very useful nowadays (Hierro, 2007; Hierro and Maza, 2010). In particular, among the different Italian interregional migration distinguished by educational level, the high-skilled migration trend seems to show the highest growth rate with respect to the initial year (Fig. 1). On the contrary, the lower mobility growth of medium- and low-skilled individuals confirms how in Italy the graduate individuals are more mobile.



Figure 1: Dynamic of migration flows (2004-2012).

Source: own elaboration on ISTAT data.

Moreover, the individual decisions to re-locate, besides registering a general growth during the considered period, is also characterized by a main direction. Fig. 2 highlights how the negative net migration of the Southern provinces is responsible of 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 flows of individuals. The Istat dataset provides five educational level starting from the individuals without education to the tertiary educated people. Following 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>5</sup>. Therefore, the inmigration and the out-migration stocks of human capital for each region *i* (HK<sub>i</sub>) are constructed separately through the following equation:

$$HK_{i} = \frac{\sum_{k} migr_{k} year_{k}}{\sum_{k} migr_{k}}$$
(1)

where k = 1, ..., 5; year<sub>k</sub> is the number of year of schooling for the level of education k and migr<sub>k</sub> is the number of migrants of schooling level k.

It is interesting to observe how the human capital net migration present a common feature. In particular, the Southern provinces continue to register negative net migration out-flows in favour to the Central-Northern

<sup>&</sup>lt;sup>5</sup> Individuals who do not have acquired at least a primary education have received 0 years of schooling.

provinces (Fig. 2). It is, also, evident 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.

These findings are also supported by Ciriaci (2014) who, by analysing a sample of graduates in the 2004, found that the Southern regions show the highest emigration rate both *ante-* and *post-lauream*. Ciriaci (2014) also describes a lower percentage of individuals who migrate from the Central-Northern regions, which is line with our results and, indeed, the percentage of graduates who move from the Centre-North to the South is 5-6% during the whole period. Always considering these two macro-areas, Nifo and Vecchione (2014), report a negative migration balance for the Mezzogiorno and, more specifically, almost 25% of the graduates decide to transfer their residence from the South to the Centre-Nord or abroad. On the contrary, the more industrialized Centre-North exhibit a positive balance equal to 11%. These results can also be extended to the *ante-lauream* migration by confirming a negative trend in the Mezzogiorno which lost, in 2004, 3546 students who completed their cycle of degree in a Central-Northern region (Nifo and Vecchione, 2014).

Figure 2: Human capital net migration flows (average 2004-2012).



Source: own elaboration on ISTAT data.

Furthermore, if we distinguishing the interprovincial migration flows between the Central-Northern provinces and the Mezzogiorno, table 1 highlights how the decision to re-locate not only occur, as extensively pointed out by the economic literature, from the South to the Centre-North, but also, and this is a main novelty feature, among the Central-Northern provinces. As we can see in the same table the sum of these two kinds of internal migration represent in the 2012 approximately the 72% of the total migration flows. However, when we consider the interprovincial mobility from different regions (NUTS1 and NUTS2) the situation completely change. Table 1 shows, indeed, that on average the number of migrants among Central-Northern provinces drastically decrease when we consider the interprovincial migration that presume a change of residence, not only from a different province, but also from a different region (NUTS1 or NUTS2). This characteristic would encourage a deeper investigation in order to evaluate some possible heterogeneous effects of these flows that overcome the regional boundaries.

Table 1: Total migration flows between Italian macro-areas (Centre-North and South)

	2004	2005	2006	2007	2008	2009	2010	2011	2012
Among Central-Northern Provinces	215733	213842	219947	218090	216678	203641	218235	216210	246727
From different regions (NUTS2)	100999	99220	100333	99157	100613	94731	97025	96084	109438
From different macroareas (NUTS1)	58784	57210	57389	56956	58296	54746	55635	55792	62703
South to Centre-North	111476	106343	108177	107133	110503	99101	99926	101618	119030
Among Southern Provinces	57480	57829	61600	64583	64920	61562	63836	65756	76352
From different regions (NUTS2)	18903	18793	19470	20088	19621	18685	18579	19802	23286
From different macroareas (NUTS1)	6676	6242	6553	6687	6340	6086	6116	6073	6916
Centre-North to South	63799	63447	62062	61050	61376	61017	60496	54706	62630

Source: own elaboration on ISTAT data.

#### 4. Empirical analysis

#### 4.1 Econometric issues

In this section, the relationship between human capital mobility and institutional quality is tested through a panel data econometric model. 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). Each specification also has a set of control variables represented by the degree of trade openness (open) and the ethnic fractionalization (ethnic). These variables are in line with multiple studies, which stress the role of these factors in determining the level of institutional quality. We also include the initial level of institutions in the model, because it allows to consider the persistence of institutional quality.

The model is formulated as follows:

$$I_{i,t} = \beta_1 I_{i,t-1} + \beta_2 hk_{imm_{i,t-1}} + \beta_3 hk_{emig_{i,t-1}} + \gamma_1 open_{i,t-1} + \gamma_2 fraction_{i,t-1} + \mu_i + \eta_t + \varepsilon_{i,t}$$
(2)

where i = 1,2,...,103 is the province and t=2004, 2008 ... 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. In the dataset the level of education of the migrants is directly observed and, thus, the human capital is proxied through the average years of schooling (hk\_imm and hk\_emig). The model includes all the time effects ( $\eta_t$ ) and the provincial time-invariant characteristics ( $\mu_i$ ). We must also consider that the institutional quality is influenced by other variables. Hence, a series of control variables are included in the regression.  $\gamma_1$  is the coefficient associated to the degree of openness (open) and, finally,  $\gamma_2$  is the parameter related to the ethnic fractionalization (fraction).

The analysis shows the presence of regional fixed-effects  $(\mu_i)$  that make the ordinary least-squares estimator unreliable. For this reason, the paper performs the Hausman specification test in order to verify if the distribution of the individual heterogeneity is deterministic or stochastic. The result confirms that the fixed-effects model is the most suitable estimator to the data. Indeed, the null hypothesis of this test (i.e. the random-effects model is consistent and efficient with respect to the fixed-effects estimator which is only consistent) is rejected at a significance level of 0.10.

However, although this specification is able to control the time-invariant, different provincial characteristics, which represent the unobservable heterogeneity, the fixed-effects model does not allow the capture of the issue of endogeneity due to the presence of some potentially endogenous variables among the explanatory variables. In particular, the reverse causality between institutions and human capital could create a systematic distortion. As a result, the estimated coefficients through a static panel approach, such as fixedeffects or random-effects, could be biased. Anderson and Hsiao (1982) proposed a solution to this simultaneity bias by transforming the equation in first differences and then by searching for instrumental variables (IV). However, when the lagged dependent variable is present among the regressors it is necessary to instrument both the lagged dependent variable and the other endogenous variables. Arellano and Bond (1991) proposed a generalization of the method suggested by Anderson and Hsiao. In this context, the firstdifferences of the endogenous explanatory variables are instrumented by a set of lagged levels of the same explanatory variables. In line with these considerations, some studies have adopted a dynamic panel approach through a difference-GMM (Niebuhr et al., 2012; Vidyattama, 2014). Arellano and Bover (1995) and Blundell and Bond (1998) extend this technique by adding to the equation in first difference the equation in levels 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. The internal instruments of the SYS-GMM estimator also gives the possibility to consider each control variable (the degree of openness and the ethnic fractionalization) as potentially endogenous. The economic literature, indeed, has demonstrated how institutions affect the human capital accumulation as well as the trade intensity and the presence of foreign individuals.

As a result, the paper aims to estimate this relationship by implementing a SYS-GMM. However, it is a well-known fact, that when the number of instruments becomes large, the estimation accuracy decreases. Different authors, indeed, have demonstrated the trade-off between the increase in terms of efficiency, due to a wider set of moment conditions, and the negative impact on the consistency of the estimates when the number of instruments increases (Bekker and Society, 1994; Newey and Smith, 2004; Ziliak, 1997). Moreover, Roodman (2009) states that the power of test of over-identyfing restrictions decreases as the

number of instruments becomes larger. The same author proposed to keep the number of instruments lower than a maximum threshold given by the number of units, in this case the 103 Italian provinces. In order to avoid a different lag structure for each specification, and in line with previous works (Spilimbergo, 2009; Docquier et al., 2016) all the explanatory variables are treated as endogenous and instrumented with their first to third lags.

The validity of moment conditions is tested by implementing the Hansen J test of over-identifying restrictions and by testing if the error term is not second order serially correlated.

## 4.2 Econometric results

Table 2 reports SYS-GMM estimates for dynamic specification. Standard errors are robust and clustered by province. All the explanatory variables are treated as predetermined and instrumented with their first to thirds lags. The coefficient for the lagged dependent variable is always positive and statistically significant which demonstrates a persistence of institutions during the considered period.

By focusing on the variables of interest, the first specification (column 1) highlights a positive effect of the human capital in-flows on the institutional quality index (iqi). On the contrary, the loss of human capital, contributes to reduce the institutional quality of a province. These results seem to be heterogeneous when we investigate the effect of human capital on all the different dimensions of institutions. More specifically, both the magnitude of the coefficients associated to the human capital emigration and the statistical significance differ among the different dimensions of governance.

In particular, provinces that lose human capital exhibit a deterioration of the level of control of corruption (-0.0837), of the regulatory quality (-0.0969) and of the rule of law (-0.0344). On the other hand, the in-flows of human capital positively affect each institutional dimension and to a greater extent increases the ability to promote the private sector (regulatory quality) and the ability of the citizens to select the governing class (voice and accountability).

The models also include a set of control variables that have been shown to contribute to determining the institutional quality. The coefficients for all the control variables are as expected. First, according to Alesina et al. (2003), the ethnic fractionalization exerts a negative impact on the different dimensions of institutions. In particular, the authors show that the quality of institutions is inversely related to the foreign born population and, indeed, if a society presents a higher level of fragmentation, some groups can impose restrictions on the other groups. Otherwise, mainly homogeneous societies can be easily ruled as well as increase the possibility to monitor possible conflicts (Alesina et al., 2003). Finally, a greater degree of openness positively affects the institutional quality of a province as demonstrated by the positive coefficient associated to the degree of openness.

The estimates are robust. Since the model is over-identified, we use the Hansen 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%, 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.

# Table 2: Estimation results

Variables	iqi (1)	corruption (2)	government (२)	regulatory (۵)	rule of law (5)	voice (6)
imm_hk	0.0895***	0.0445**	0.0371***	0.0907***	0.0503***	0.0830***
	(-0.0144)	(-0.0214)	(-0.0122)	(-0.0191)	(-0.0137)	(-0.0138)
emig_hk	-0.0793***	-0.0837***	-0.0001	-0.0969***	-0.0344***	-0.0074
	(-0.0137)	(-0.0173)	(-0.0137)	(-0.0225)	(-0.0124)	(-0.0109)
foreign	-0.0001**	-0.0008*	-0.0019***	-0.0019***	-0.0005	-0.0006**
	(-0.0003)	(-0.0004)	(-0.0004)	(-0.0005)	(-0.0003)	(-0.0003)
open	0.0402**	0.1112	0.0539	0.2048***	0.0446	0.0731*
	(-0.0392)	(-0.0682)	(-0.0673)	(-0.0448)	(-0.0383)	(-0.0395)
L.iqi	0.6970***					
	(-0.0418)					
L.corruption		0.4374***				
		(-0.0924)				
L.government			0.7977***			
			(-0.0435)			
L.regulatory				0.4176***		
				(-0.0618)		
L.ruleoflaw					0.6886***	
					(-0.0422)	
L.voice						0.7100***
						(-0.0607)
constant	0.0933	0.8137***	-0.2022**	0.3894**	0.0056	-0.5969***
	(-0.0873)	(-0.0682)	(-0.0918)	(-0.1683)	(-0.0838)	(-0.1059)
NX I	824	824	824	824	824	824
N Time dumming	103	103	103	103	103	103
First-order autocorrelation	Yes	Yes	Yes	Yes	0.000	0.000
Second-order autocorrelation	0.000	0.000	0.000	0.000	0.000	0.000
Hansen test	0.2663	0.34	0.4897	0.3055	0.3015	0.2034
Hansentest	0.285	0.28	0.295	0.296	0.282	0.316

Source: own elaboration on Nifo and Vecchione (2014) and ISTAT data.

### 5. Preliminary conclusions

Recent literature has paid growing attention to the mechanisms able to affect the institutional development. Among these factors, the human capital mobility plays a key role as a potential source of institutions. However, the difficulties that arise to measure the institutional quality at provincial level has led to an absence of empirical contributions on the impact of the interregional mobility of skilled individuals on institutional outcomes at regional level.

The present paper tries to fill this gap by empirically investigating the relationship between human capital mobility and institutional quality in a large sample of 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 must be seen from two complementary perspectives. First, the descriptive analysis has demonstrated, according to the economic literature, a direction of the human capital mobility from the Southern provinces to Central-Northern ones and an impoverishment of the Mezzogiorno which has lost, during the whole period, a huge number of skilled individuals.

Second, the main outcome related to the econometric results confirm how the human capital mobility has important consequences on the institutional quality. In particular, we can observe a heterogeneous effect between immigration and emigration. The findings show that the human capital in-flows have a positive impact on the quality of institutions of Italian provinces. On the contrary, the loss of human capital, contributes to reduce the institutional quality of a province. However, the results vary across the different dimensions of institutions, indeed, the main channels through which the human capital mainly affect institutions seem to be the level of corruption, the regulatory quality and the rule of law.

In summary, if the vast majority of works have highlighted how 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 underlining how the human capital mobility significantly affect one of the most important source of economic growth, the institutions and its components. Furthermore, the Italian provinces seem to show heterogeneous results among different dimensions of institutions. In terms of control of corruption and government effectiveness the results show a decreasing process of institutional disparities while, on the contrary, there is a significant divergence when we consider the rule of law, the regulatory quality and the voice and accountability.

We strongly believe that this analysis can shed light, through new empirical evidences, on better understanding the potential effects resulting from the relationship between human capital mobility, institutional quality and regional growth. Nevertheless, the results presented in this paper provide a possible direction for future research. It might be interesting to investigate the effects related to the international human capital migration on institutions. In this manner, we could have more indications whether the dynamics of human capital mobility contribute to increase the institutional and economic disparities.

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