Does institutional quality matter for lending relationships?

**abstract**

Why the number of banking relationships per firm varies so much across space? Is it due to microeconomic features of firms localized in different places or is there something systematic, connected to geographical macroeconomic factors? Does local institutional endowment matter in the firm’s choice? We address these issues with reference to the Italian case, one particularly interesting because of the substantial institutional gap between Center-North and South, and the high average number of banking relationships. Consistent with previous studies, we find that provincial institutions are a basic determinant of the observed differentials in the number of banking relationships per firm.

***Keywords***: Firm-Bank relationships, Institutional quality, Relationship lending, Italian manufacturing SMEs.

***JEL***:G20; G21; L60; O43; R11

1. **Introduction**

During the last two decades, the literature has paid great attention to the widespread use of multiple banking relationships. In almost all countries, even relatively small firms borrow from several banks at the same time, even if the distribution of the number of banking relationships per firm substantially varies across countries. Ongena and Smith (2000), using a dataset of 1079 large firms from 20 European countries, document that single-bank relationships are relatively rare, and Italy – with an average number of 15 banking relationships per firm - is the country where the phenomenon of multiple borrowing is most common. This is confirmed by Detragiache et al. (2000) comparing samples of small firms operating in the United Stated and Italy. They show that single banking is relatively common in the United States (where the median number of relationships is 2, and 55,5% of firms deal with more than one bank), while in Italy 89 percent of firms rely on multiple banking, the median number of relationships is 5, and the 75th percentile is 8 (against only 2 in the United States).

To better understand the reasons behind the diversity of firms’ preferences about the number of banking relationships, many economic motivations have been set forth. A number of contributions have focused on the microeconomic aspects of the individual choice, i.e. firms’ features such as size, age, propensity to innovate, the endowment of human capital, the amount of R&D investment, and so forth. Theory predicts that larger and older, more innovative and financially distressed firms (Horoff and Korting, 1998a) are more likely to resort to multiple bank relationships. On the empirical ground, some evidence shows that multiple relationships are associated with higher borrower riskiness (Foglia et al., 1998), while other authors point out that relationship oriented lenders have a ratio of bad loans lower than the average (Horoff and Korting, 1998a; Ferri and Messori, 2000; Farinha and Santos, 2002). Moreover, the firms’ decision can be traced back to a cost-benefit assessment: firms may prefer to borrow from more than one bank to increase total leverage (Cosci e Meliciani, 2000) and credit availability (Petersen and Rajan, 1994, 1995; Bianco, 1997; Sapienza, 1997; Cole, 1998; Haroff and Korting, 1998b), to reduce the cost of debt (Rajan, 1992), and avoid liquidity problems (Detragiache et al., 2000).

On the other hand, it has been also recognized that often macroeconomic structural factors matter as well: for example, regional productive specialization, technology diffusion, degree of markets’ competition and institutional factors have been deemed to be relevant in driving firms’ preferences, to the extent that they affect the financial market structure and shape differences in the relative expected profitability of firms’ choices. In particular, the role of institutions in influencing financial systems and the behaviour of firms in financial markets has been largely acknowledged by the economic literature (Chinn and Ito, 2006; Sierra et al., 2006; Claessens and Leaven, 2003; Garretsen et al., 2004; Andrianova and Demetriades, 2004; Neuberger et al., 2008), which in most cases has dealt with cross-country analysis, and referred to national institutional endowments. In line with recent developments of the literature, this paper adopts an approach emphasizing in particular the link among *local* institutional quality and firms’ preferences on the number of bank relationships. In recent years, eminent contributions have focused on institutional settings at local level, recognising that even *within* a single country, differences in institutional quality may be relevant, and play a crucial role in determining firms’ choices. Thus it comes as no surprise, and there is extensive evidence thereof, that although the institutional framework mostly applies all over a country, its effectiveness is not the same in different areas (Guiso et al., 2004), because different quality of local institutions entails disparities in the rule of law, the provision of local public goods, the security of local property rights (Aron and Dell, 2010) and so on. Hence, a large strand of the literature has recognized an influence of local institutions on small and medium sized enterprises (La Porta et al., 2010), i.e. those firms more conditioned by the different challenges, opportunities and constraints connected to the geographical context in which they are located (Pollard, 2003). In the same vein, Demirguk-Kunt and Maksimovich (1998, 1999) argue that financial policies of large and small firms are likely to be affected by institutional quality at a different layer: the former mainly influenced by national institutional factors, the latter by local (La Rocca et. al., 2010). Following this approach, the macro factors at local level such as the enforcement system, corruption, excessive bureaucratisation, poor or inefficient organisation of public services, lower endowment of infrastructures, lack of security, and an unsatisfactory social and cultural environment are expected to be especially significant to explain the observed diversity in firm behaviour (Cheng and Shiu, 2007) over and above any relevant microeconomic factor.

Evaluating the importance of *local* institutional quality is important also for other reasons. On one side, it allows to single out the national or regional sources of firm behavior, so documenting and rationalizing patterns that comprehensive explanations of growth and development should strive to match. On the other, it may signal the possible presence of inter-linkages between national and local determinants of firms’ financial decisions, which would require a more unified framework of public policies.

Addressing the issue of the choice of the number of banking relationships per firm in Italy has a strong motivation in the evidence of the long-lasting economic and institutional gap between Mezzogiorno and the rest of the country[[1]](#footnote-2). The large differences observed in regional institutional endowments match up with the evidence of large disparities occurring in a number of economic and social indicators across the country (Malanima and Zamagni, 2010; Giannola *et al.*, 2016), testifying the multifaceted nature of the Southern lag and confirming that even at the subnational level, differences in firms’ performance might be explained on the basis of institutional differences (Del Monte and Giannola, 1997; Scalera and Zazzaro, 2010; Erbetta and Petraglia, 2011; Nifo, 2011; Aiello et al., 2014). In particular, despite the increasing integration of the Italian financial system, its efficiency at local level is very different among regions (Guiso et al., 2004; Giordano et al., 2013) and, although the same laws and regulations apply throughout the country, the enforcement system does differ at local level (Bianco et al., 2005).

However, while in recent years a growing literature is focusing on the relationship between institutional quality and various indicators of firms’ performance (Aiello and Ricotta, 2016; Ganau and Rodriguez-Pose, 2016; Mannarino et al., 2016; Di Liberto and Sideri, 2015; Lasagni et al, 2015; Nerozzi et al., 2015; Raspe and Van Oort, 2011; Fazio and Piacentino, 2010), the role of sub-national institutional quality on firms’ financial choices and, more specifically, on the choice about number of bank relationships to hold remains almost unexplored. Among relevant exceptions, Sarno (2009) analyzes the relationship between the degree of enforcement at provincial level and the functioning of the financial system, confirming the role of local institutions in determining firms’ choices and local development. In the same vein, La Rocca et al. (2010) explain how local financial development and the connected institutional differences affect the financing decisions of Italian SMEs. Consistent with these findings, Agostino et al. (2010) show how better local institutions create a favorable business environment and a legal structure favouring a more effective credit protection, which in turn facilitate both firms to gain a better access to financial debt, and intermediaries to be more inclined to provide funds. Similarly, Ferri and Messori (2000) show that geographical differences in productive and socio-economic structures among Italian regions are paralleled by differences in the relationship banking patterns. Correlating the number of banking relationships with the local socio-economic structure, they find closer and longer-lasting customer relationships in Southern regions, where smaller banks and firms prevail. Likely, Cosci and Meliciani (2002) and Elsas (2002) find that the riskier business environment, the more firms engage in multiple banking relationships. Both the latter papers point out that contexts characterized by informational asymmetries, lack of transparency, higher uncertainty, corruption, excessive bureaucratization, lack of security and weak law enforcement – typically connected to poor institutional quality – give rise to incomplete contracts that encourage opportunistic behaviors and enhance the degree of contractual riskiness, thus increasing the number of firm-bank relationships.

Fitting in this strand of the literature, we aim to evaluate the role of local institutional quality in determining the number of firms’ banking relationships. In doing this, we connect the number of banking relationships to local institutional quality as measured by the Institutional Quality Index (IQI) constructed by Nifo and Vecchione (2014, 2015). This index evaluates institutional quality in Italian provinces and regions as a composite indicator derived by 24 elementary indexes grouped into five institutional dimensions (corruption, government effectiveness, regulatory quality, rule of law, voice and accountability).

To carry out the econometric investigation, we build an unbalanced panel of 5,137 firms for the period 2003-2006, for a total of 16,460 observations, by matching qualitative and balance sheet data from the 9th and the 10th  waves of UniCredit-Capitalia survey “*Indagine sulle Imprese Manifatturiere”* and other data drawn from Bank of Italy and the Italian national statistics institute ISTAT. Estimations are carried out by applying several different estimators: Probit, Poisson, Arellano and Bover (1995), Blundell and Bond (1998) GMM (*System GMM*), to address concerns of unobserved heterogeneity and potential endogeneity.

In different specifications, controlling for individual firm-level characteristics and contextual variables possibly conditioning firms’ performance, our robust results confirm that institutions matter, as they prove to be one of the main drivers of firms’ choices about the number of bank relationships: the lower level of provincial institutional quality, the higher number of bank relationships firms choose to hold. As Southern Italian provinces systematically show poorer institutions, Southern firms have a relatively high number of banking relationships.

The rest of the paper is organized as follows. Section 2 deals with the methodology used for the empirical investigation. In particular, section 2.1 presents the model; section 2.2 focuses on our explanatory variables, i.e. controls (2.2.1) and the IQI index (2.2.2). Section 2.3 illustrates the dataset and some descriptive statistics. Section 3 provides the main empirical findings and the robustness analysis (section 3.1). The main conclusions are discussed in section 4.

1. **METHODOLOGY**

This section is devoted to provide evidence about the factors driving the firm’s choice on the number of banking relationships in Italy, and in particular to single out the role of provincial institutional quality in determining this choice. To perform this task, we carry out an econometric investigation, where the number of bank relationships is the dependent variable and individual firm’s features, bank-firm relationship characteristics, local economic variables and institutional quality are explanatory variables. Our investigation finds that an institutional improvement leads to lower shares of multiple borrowing firms, thus showing that institutional quality negatively affects the number of banking relationship per firm. To properly address concerns of unobserved heterogeneity and potential endogeneity of some regressors, we alternatively adopt several estimation methods.

* 1. **ESTIMATION STRATEGY AND METHODS**

The firm’s choice to be multiple banked can be investigated by using various estimation models. First of all, it may be seen as a dichotomous choice (whether or not to be multiple banked), appropriately modeled through a binary response model. Alternatively, the number of bank relationships held by a firm can be considered as a count variable, hence another suitable model may be a count data model such as the Poisson model. Moreover, since the dependent variable tends to be persistent over time (the past number of banking relationships is likely to influence the present number), the SYS-GMM seems to be an appropriate model as well, since it also allows to control for unobserved heterogeneity and the presence of endogenous (or predetermined) explanatory variables. In the present paper we employ all the three mentioned models by estimating the following equations:

 $P\left(y\_{it}=1|X\right)=Φ(α+β\_{1}IQI\_{jt}+γX^{'}\_{it}+\sum\_{s}^{}δ\_{s}S\_{s}+\sum\_{j}^{}γ\_{j}P\_{j}+\sum\_{t}^{}φ\_{t}T\_{t})$ *(1)*

 $ NBANK\_{it}=α+β\_{1}IQI\_{jt}+γX'\_{it}+\sum\_{s}^{}δ\_{s}S\_{s}+\sum\_{j}^{}γ\_{j}P\_{j}+\sum\_{t}^{}φ\_{t}T\_{t}+v\_{ijt}$ *(2)*

$ NBANK\_{it}=α+ β\_{0} NBANK\_{i,(t-1)}+β\_{1}IQI\_{jt}+γX'\_{it}+\sum\_{s}^{}δ\_{s}S\_{s}+\sum\_{j}^{}γ\_{j}P\_{j}+\sum\_{t}^{}φ\_{t}T\_{t}+v\_{ijt}$ *(3)*

where indices *i*, *j* and *t* refer to firms, provinces and time, respectively.

In equation (1), we adopt a Probit model: the dependent variable is a dummy $y\_{ijt}$ assuming value 1 if a firm *i* located in province *j* at time *t* holds a number of bank relationships greater or equal two (and zero otherwise), and $Φ$ is the cumulative density function of the normal distribution[[2]](#footnote-3).

In models (2) and (3), the dependent variable NBANK is the number of per firm bank relationships. To estimate equations (2) and (3), we adopt the Poisson model and the Arellano and Bover (1995) and Blundell and Bond (1998) GMM (SYS-GMM) estimators, respectively.

On the right hand side of equations (1), (2) and (3), we consider IQI as our main explanatory variables using first provincial (IQI) and regional (IQI\_REG) and then provincial and regional IQI sub-indexes in place of the overall indexes. The vector X contains the control variables we introduce in the following sub-sections.

In all equations, T, S and P are set of time, sector and provincial fixed effects, respectively, while, for equations (2) and (3), $v\_{ijt}=η\_{i}+w\_{j}+e\_{it}$ is a composite error, where $η\_{i}$ and $w\_{j}$ summarize time-invariant unobserved firms’ characteristics and provincial fixed effects, and $e\_{it}$ captures idiosyncratic shocks to the number of bank relationships.

The results of estimations of equations (1), (2) and (3) are shown in the following Section 3. As we will see, they seem robust to the choice of estimation method.

* 1. **THE EXPLANATORY VARIABLES**

Explanatory variables convey information on: i) firms’ individual and bank-firm relationship characteristics, such as size, age, indebtedness, credit rationing, duration of the relationship and share of debt held by the main bank; ii) macroeconomic conditions, i.e. the development of the local banking market, provincial GDP and the number of bank branches over total population; iii) provincial institutional quality considered in terms of the value of both overall IQI and its single specific dimensions.

* + 1. **Controls**

The vector $X $of equations (1), (2) and (3) includes a number of different regressors concerning firms’ features, according to the various model specifications. To account for firm’s size, we consider the number of firm’s employees (EMP). Size is considered relevant to firms’ choice by a wide literature, arguing in favour of a positive impact on the number of bank relationships. That because, on one side, banks prefer to diversify credit risk by inducing large borrowers to engage in multiple relationships (Detragiache et al., 2000; Pelliccioni and Torluccio, 2007), and on the other side, small firms avoid multiple relationships due to the existence of fixed costs of borrowing (Guiso and Minetti, 2007).

Besides, we comprise the firm’s age (AGE) among regressors as a proxy of firms’ transparency, to acknowledge that for older firms the possibility for lenders to access information relevant to gauge riskiness and reliability is greater. However, more generally, the effect of firm’s age on the decision of multiple banking is controversial. A few studies argue that mature firms surviving the critical start-up phase and having a known history about past performance are less opaque and therefore may enjoy more and cheaper credit by a larger number of banks (Diamond, 1991). On the contrary, other scholars state that being less subject to adverse selection, mature firms with a “track record” may consistently prefer to maintain a smaller number of bank relationships (Detragiache et al., 2000).

We also consider indicators of product/process and organizational innovation (INPP, INORG respectively), a dummy (HT) to take into account whether the firm belongs to a HiTech industry, and the ratio of intangible to total assets (INTAS). According to Elsas (2004), the firm’s attitude to innovate is a proxy of informational transparency. More innovative firms tend to prefer close banking relationships to avoid the diffusion of information to direct competitors (Yosha, 1995). On the other hand, they may prefer multiple relationships to prevent the *hold up* problem[[3]](#footnote-4). Moreover, firms operating in high-tech sectors and firms with a higher ratio of intangible to total assets may be subjected to multiple-banking due to the propensity of banks to carry out a higher differentiation of credit to risky and opaque borrowers (Pelliccioni and Torluccio, 2007).

Concerning financial variables, we consider as an additional regressor the ratio of financial liabilities to equity (LEVER), in accordance with the hypothesis that more leveraged firms establish a higher number of bank relationships (Carletti et al., 2004), also considering that the problem of adverse selection might be more severe for them than other firms (Detragiache et al., 2000). Variables accounting for credit rationing (CRED), duration of the relationship with the main bank (DURAT) and share of debt held by the main bank (MAIN) are also included. In order to minimize the risk of being credit rationed, firms may be more willing to establish and maintain multiple relationships (Detragiache et al., 2000); time duration and the relative weight of the main bank may be relevant too, considering that on one side asymmetric information problems are mitigated in the case of a single relationship, and on the other side, a strong bargaining power of the main bank may push it to apply worse conditions to borrowers (Sharpe, 1990; Rajan,1992).

Finally, local macroeconomic conditions are accounted for by including the variables RGDPC, i.e. the provincial per-capita real GDP, and BRANCH, i.e. the number of bank branches over total population. Through the first variable, we try to account for the fact that firms located in highly developed areas on one hand may need to establish more banking relationship to satisfy their needs of multiple financial services, and on the other hand may more easily finance their investment projects through internal financial resources, and not need to resort to many lenders. Even the impact of BRANCH is a priori ambiguous: indeed, if the presence of new banks in provincial credit markets induces better monitoring and screening processes, thus increasing soft information collected by intermediaries (Benfratello et al., 2008), multiple banking relationships may arise, but it is also true that a closer proximity can induce higher market power allowing banks to charge higher interest rates (*hold up* problem).

Moreover, we include some other control variables to account for observable firm-specific characteristics. First, we control for firm belonging to a group (GROUP) or taking part in a consortium (CONS) which may involve less need to hold multiple relationships, thanks to the chance of receiving credit from other members, or benefitting from a main bank financing all firms of the group/consortium (Detragiache et al., 2000). Second, we include the dummy variable COOP to detect if co-operative firms hold a lower number of bank relationships given that they are generally financed by cooperative and popular banks, with which they engage close banking relationships (Ferri and Messori, 2000; Cosci and Meliciani, 2005). Third, internationalized firms may need a higher number of bank relationships to manage their foreign transitions. Thus, we include the variable EXP coded one if a firm exports its products to foreign countries (and zero otherwise). Also, to check whether firms having more liquidity keep a lower number of bank relationships, we include the variable QUICK defined as the ratio of current asset and inventories to current liabilities. Finally, all estimations include industry dummies to control for heterogeneity at industry level (2-digit Ateco classification).

The explanatory variables we employ in the econometric investigation are listed in the following Table 1, reporting also the main summary statistics.

[Table 1]

Finally, it is worth highlighting that the provincial GDP of a geographical area is likely correlated with its institutional quality. In particular, the institutional quality of a province may be an effect of the economic development characterizing the same area. Consequently, GDP might tend to absorb the effect that institutional quality may have on multiple banking relationships. Therefore, trying to isolate the impact of institutional quality on multiple banking, we carry out several sensitive checks. As a first, we run all the regressions excluding the variable RGDPC (Provincial real per capita GDP). Second, we re-run all the regressions including this variable. Third, we carry out the regressions including the variable RGDPC, but considering only firms located in the North of Italy, where economic development is more homogeneous.

* + 1. **THE INSTITUTIONAL QUALITY INDEX (IQI)**

The last variables we employ are indicators of institutional quality, the focus of our analysis, proxied by the IQI index built by Nifo and Vecchione (2014, 2015) on a yearly basis, at the provincial (NUTS3) level. Inspired by the WGI framework (Kaufmann et al., 2011), IQI evaluates institutional quality in Italian provinces as a composite indicator derived by 24 elementary indexes grouped into five institutional dimensions (corruption, government effectiveness, regulatory quality, rule of law, voice and accountability). Appendix A reports the list of all elementary indexes employed and sources. Aggregate indicators for each of the five dimensions are derived from elementary indexes, and then from the latter the overall IQI index is similarly built up. The method used to obtain each upper-layer indicator from the lower layer ones develops in three phases: normalization, attribution of weights to each index and aggregation. Normalization consists in reformulating the original measure of indexes so as to have variation ranges included in the [0,1] interval. Weights are then assigned by applying a method known as Analytic Hierarchy Process (Saaty, 1980): starting from pairwise comparisons between indexes of the same layer, this technique turns verbal judgments on the relative importance of each index into a matrix of numerical values of importance. Then weights are assigned as the solution of a system generated by the eigenvector associated to the maximum eigenvalue of the matrix. Finally, upper layer aggregate indexes are computed as weighted averages of the lower layer ones. The analysis of the geographical pattern of IQI in Italy depicted in Figure 1 shows that, like for a broad range of socio-economic conditions, even for institutional quality a clear North-South divide emerges, since most of provinces of the South are characterised by lower levels of institutional quality than the rest of Italy[[4]](#footnote-5).

[Figure 1]

* 1. **DATA AND DESCRIPTIVE STATISTICS**

The empirical investigation is based on data retrieved from several sources. Firm-level information on Italian manufacturing small and medium enterprises (SMEs) is drawn from the 9th and the 10th  waves of UniCredit-Capitalia survey “*Indagine sulle Imprese Manifatturiere*”. Each issue refers to three years: the 9th supplies data for 4,289 firms for the period 2001-2003; the 10th reports data for a panel of 4,126 firms for the period 2004-2006. Information collected is both qualitative and quantitative: the year of establishment, group membership, size, industry, firm’s legal form. Information on the firm’s financial structure (such as the number and length of bank relationships) and balance sheet data are also provided [[5]](#footnote-6). By matching survey and balance sheet data retrieved from both issues, we obtain an unbalanced panel of 5,137 firms and 16,460 observations[[6]](#footnote-7). We focus on Italian manufacturing SMEs, for which bank lending constitutes the major source of financing (Bank of Italy, 2007; European Commission, 2010), and thus we drop from our sample 240 firms, i.e. the biggest ones, with more than 250 workers, and those listed on the Stock Exchange.

To supplement this dataset, we also use data on the territorial distribution of branches for each Italian bank (Bank of Italy, 2010 and 2011) and provincial data for per capita GDP and industrial specialization (ISTAT, 2010 and 2011). Finally, we exploit the information on local institutional quality in Italian regions contained in the Institutional Quality Index (IQI) by Nifo and Vecchione (2014, 2015), described in the section above.

Tables 2 and 3 supply some information and descriptive statistics on the number of bank relationships respectively by region and class of employees.

[Table 2]

[Table 3]

In particular, Table 2 indicates that on average at the national level sampled firms hold about 5 bank relationships . About 20% of them have 1 or 2 bank relationships, 62.5% between 3 and 7 and 17.5% more than 7. A striking evidence is that Northern (except Liguria) and Southern (except Abruzzo) regions show values lower than the national average. Conversely, for all the regions of Central Italy (except Lazio) the average number of bank relationships is well above the national average. Second, the regions with the highest share of firms with 7 or more bank relationships are Umbria (34.69%) in the Centre, Abruzzo (20.87%) in the South and Friuli Venezia Giulia (20.19%) in the North. Third, as we can see in Figure 2, in most cases (Campania, Puglia, Lombardy, Sicily and Piedmont) the variability within each region is high, since some provinces show on average 7 or more firm-bank relationships, while others have less than 3-4. Inspection of Figures 1 and 2, illustrating the provincial values of IQI and average number of bank relationships, allows to have a first glance at the connection between the two variables.

[Figure 2]

Table 3 shows that the number of bank relationship increase with firm’s size: firms with 1-9 employees have 3 bank relationship, firms with 10-49 around 4.4 and firms with 50-250 around 6.3. A similar pattern emerges when looking at the distribution within each size class: firms choosing to have only 1 or 2 banks are 63% in the class 1-9 employees, 28% in the class 10-49 and only 12% in the size 50-250. Inversely, while 36% of firms belonging to the class 50-250 employees prefer to have more than 7 banks, only 13% in the size 10-49 and 6% in the size 1-9 share the same choice.

Table 4 reports the average values of the regional IQI index (IQI\_REG) and the number of banking per firm (NBANK) by region in 2006.

[Table 4]

Regions are sorted in Table 4, whence the institutional quality divide between the country’s North and South clearly emerges. Indeed, while the lowest 8 IQI scores are always associated with Southern regions, the highest 12 ones conversely refer to regions located in Centre-Northern regions. Both these results seem mainly driven by the values of rule of law (RULAW), government effectiveness (GOVERN) and the voice and accountability (VOICE), particularly weak in the Southern regions compared to the regions of Centre-North. Conversely, the sub-index Corruption (CORR) seems to be characterized by values largely homogeneous in all regions of the country.

Finally, Table 5 shows the correlation matrix among the variables considered in Table 4: number of banks (NBANK), IQI at provincial and regional level (IQI and IQI\_REG) and the IQI dimensions at provincial level: corruption (CORR), government effectiveness (GOVERN), regulatory quality (REGUL), rule of law (RULAW) and voice and accountability (VOICE).

[Table 5]

1. **RESULTS**

Table 6 reports the results obtained by estimating model (1), (2) and (3) by Probit, Poisson and SYS-GMM estimators, respectively. In the case of Probit and Poisson estimations, marginal effects are reported (for both pooled and panel forms), in order to have a more immediate interpretation of results[[7]](#footnote-8). For the SYS-GMM regressions, the estimated coefficients are reported[[8]](#footnote-9). All regressions are performed including provincial, year and sector fixed effects. The standard errors are clustered at province level (NUTS3) and consistent with the presence of any pattern of heteroskedasticity.

Column 1 of Table 6 displays results obtained when excluding the control variable RGDPC . In this case, our variable of interest IQI (the provincial institutional quality) is negative and statistically significant in most models. Whence, a better institutional quality turns out to decrease both the propensity to be multiple banked and the number of bank relationships for firms.

[Table 6]

Looking at the control variables, we found that the coefficients of variables EMP, AGE, LEVER, QUICK, HT, INPP and EXP assume the expected sign and are in most cases statistically significant at 1% level. On the other hand, the variables INTAS, INORG, MAIN, CRED and BRANCH turn out significantly affect the dependent variables only in a few cases. The other control variables are not statistically significant.

Column 2 of Table 6 displays results obtained when excluding the control variable RGDPC and considering IQI at the regional level (IQI\_REG). The results above discussed are substantially confirmed.

We run separate diagnostics test for Probit, Poisson and GMM model. For the Probit model we look for mis-specified functional form. As a whole, it seems the functional form of $Φ$is appropriate[[9]](#footnote-10). To test for the Poisson equidispersion assumption, we perform a likelihood ratio test of over-dispersion, showing no evidence of it. Regarding GMM estimations, the Hansen test does not reject the null hypothesis of validity of the over-identifying restrictions, while the difference-in-Hansen test turns out to be not significant, thus supporting the validity of extra instruments used by the SYS-GMM estimator. Besides, the values of the Arellano-Bond tests for autocorrelation in first (AB test AR1) and second differences (AB test AR2) tend to support the assumption of lack of autocorrelation in the errors in levels.

An interesting question is whether the negative relationship between institutional quality and multiple banking could be specifically attributed to one or more of the dimensions included in the synthetic index. To study the possible different effects of each dimension composing IQI, we estimate five supplementary sets of regressions by using in turn one of the IQI dimensions as regressors instead of the overall index. Table 7 reports the results obtained by estimating model (1), (2) and (3) with the Probit, Poisson and SYS-GMM estimators, respectively[[10]](#footnote-11). Column 1 and 2 show the output for each sub-index at the provincial and regional level, respectively, obtained when not including the control variable RGDPC.

[Table 7]

. According to the results of Table 7, the sub-index GOVERN (Government Effectiveness ) is negative and statistically significant in most models, appearing to be the most important sub-index in explaining multiple banking. On the other hand, the sub-indexes RULAW (Rule of Law), VOICE (Voice and Accountability ) and REGUL (Regulatory Quality) are negative and statistically significant only in few cases, while the sub-index CORR is never statistically significant[[11]](#footnote-12).

Column 2 of Table 7 displays results obtained when considering the sub-indexes at the regional level. The results above discussed are substantially confirmed.

Our results show that institutional quality negatively affect multiple banking relationships. This is probably because good institutions are associated to an environment where banks and firms favourably interact to exchange information and promote close banking relationships. In other words, institutions may create good conditions in mitigating asymmetric information allowing firms and banks to catch all benefits deriving from close banking relationships. More in detail, the institutional quality dimensions that appear to be significant are GOVERN, RULAW, and VOICE.

Regarding the relevance of Government Effectiveness (GOVERN) and REGUL (Regulatory Quality), our results point out that the administrative capacity of local governments in terms of quality of policies and public services, decreases the number of bank relationships and the firm’s propensity to be multiple banked. This outlines the impact that intermediate government bodies (primarily local political and administrative institutions) play in a more active and positive way, thus influencing firms’ financial decisions. So, as more effective public policies in (say) health, waste management and environment, transport and education are found to affect the business environment, reduce transaction costs and informational asymmetry (Kneller and Misch, 2010; Datta, 2008; Shirley and Winston, 2004), they make also easier close banking relationships.

When considering the IQI dimension Rule of Law (RULAW), the interpretation of this evidence hinges on the fact that “*Transaction costs are far higher when property rights or the rule of law are not reliable. In such situations private firms typically operate on a small scale, perhaps illegally in an underground economy, and may rely on bribery and corruption to facilitate operations*” (Aron, 2000). This view is in line with the main theoretical and empirical literature that widely acknowledges the role of “Rule of Law” in fostering economic development and firms’ choices (Ayres, 1998; Buvinic and Morrison, 2000; Islam, 2003; Dam, 2006; World Bank, 2006; Lorentzen et. al, 2008; Nifo et al., 2016) meaning that institutional contexts characterized by a relatively high incidence of crime, tax evasion, shadow economy, poor law enforcement and higher judicial costs, negatively influence the firms’ propensity to maintain multiple bank relationships.

What is more, the results of regressions obtained with the significant IQI sub-index Voice and Accountability (VOICE) confirm the crucial role of social participation on the business environment and than on firms’ behaviour (Powell and Owen-Smith 2004; Sorenson 2003; Tallman et al. 2004). Particularly when the asymmetric information problem is severe, favourable social interactions might represent an indirect form of control to avoid opportunistic and anti-social behaviors leading banks and firms to establish close lending relationships being easier for banks to gain firm’s qualitative information and benefit from its use.

Finally, when IQI is replaced by the sub-index Corruption (CORR), we do not find significant effects on multiple banking relationships. The CORR sub-index has the expected sign across all models (negative), but the coefficients are never statistically significant. According to other scholars, a possible explanation is that the level of corruption is quite similar across Italian regions (De Rosa et al., 2010; Lasagni et al., 2015; Nifo et al., 2016), and small differences are unlikely to be associated with differentials at firm level.

The evidence we present on the Italian case seems to confirm the validity of our working hypothesis. As a matter of fact, our econometric investigation, controlling for firms’ individual characteristics (size, age, leverage, export, hi-tech, etc.) , bank-firm characteristics (credit rationing, duration of the relationship and share of debt held by the main bank) and geographical variables (the number of bank branches over total population), recognizes a significant role to institutional quality in the number of banking relationships.

* 1. **ROBUSTNESS**

For robustness purposes, we carry out several sensitive checks of our findings. First, estimation is also made considering regional GDP per capita (RGDPC). Our findings (Table 8, column 1) seem to confirm the hypothesis that local institutional quality plays a significant role in determining firms’ choice of number of banking relationship[[12]](#footnote-13). As a matter of fact, once controlled for firms’ individual characteristics (size, age, leverage, export, hi-tech, etc.), bank-firm characteristics (credit rationing, duration of the relationship with the main bank and share of debt held by it) and the economic condition of firms’ province of origin (regional per-capita GDP and the number of bank branches over total population), we find that institutional quality is relevant to the choice of the number of banking, with relatively high marginal effects.

As a second robustness check,we re-run all the models considering only the firms located in the Centre and North of Italy and including the variable RGDPC, where observations are more homogeneous in term of GDP and, hence, where the variation of GDP may be smaller. Again, as shown in Table 8, column 2, results are substantially unchanged for the IQI at the provincial level (IQI) and for all the control variables [[13]](#footnote-14).

We carry out the robustness checks above, even considering each sub-index composing IQI when including RGDPC but considering only the Centre and North of Italy. The results appear not systematically different from the above results. For the sake of conciseness, we omit the results above depicted making them available upon request.

Moreover, the results above discussed remain substantially unchanged when we substitute some control variables with alternative proxies (in detail, INTAS is replaced with TGAS; LEVER is substituted by BANKD; the control variable LIQUI is replaced by QUICK and FIND)[[14]](#footnote-15).

1. **CONCLUDING REMARKS**

In this paper we investigate on the effect of provincial institutional quality on the number of banking relationships in Italian manufacturing firms for the period 2003-2006. In doing this, we measure institutional quality by the IQI index, a composite indicator of provincial institutional quality derived by 24 elementary indexes grouped into five institutional dimensions (Corruption, Government Effectiveness, Regulatory Quality, Rule of Law, Voice and Accountability).

The robust result, in line with our hypotheses, is consistent with most of the existing literature that ascribes a key role to the business environment and institutional context in determining firms’ behaviours. In our estimations, institutional quality turn out to explain a proportion of the variation left unexplained by firm and industry variables: we show that firms have more bank relationships in Southern Italian regions, as these are characterized by lower level of institutional quality. The results seem to suggest that typical close banking relationship problems encouraging multiple borrowing, such as hold-up, soft budget constraint and liquidity problems may be mitigated in environments characterized by a high institutional quality setting. Indeed, to avoid the hold up problem, a firm may threaten its main bank to interrupt the relationship and move to another bank. This is a credible threat only in high social capital context and efficient legal-financial and government systems, where moving to another bank is easier, given that information asymmetries are less strong and exchangeability of information is wider. The same may happen for the soft budget constraint problem: good institutions make it unprofitable for firms to behave in an antisocial way (e.g. practicing strategic default) since they may lose benefits deriving from networking. Similarly, the liquidity problem may be overcome as other banks could have easily access to firms’ information.

More specifically, we find that: 1) better local institutions are drivers of firms’ choices increasing their propensity to maintain single bank relationships; 2) considering the IQI sub-indexes, the dimension GOVERN, summarizing the administrative capacity of local governments in terms of quality of policies and public services, decreases the number of bank relationships and the firm’s propensity to be multiple banked; the dimension RULAW, specifically accounting for aspects related to legal certainty, exerts a significant impact on firms banking decisions; the sub-index VOICE, accounting for the social capital endowment at the local level, reduces the firm's propensity to be multiple banked; 3) interestingly and - in some way - surprisingly, but in line with previous studies, Corruption (CORR) does not seem to exert any impact on firms’ decisions.

The main conclusion of this paper, i.e. institutional quality is a major determinant of firms’ decisions on the number of banking relationships, suggest that future research should carefully consider the possible consequences of alternative institutional settings on a set of economic variables larger than those usually taken into account. The presence of invaluable spillovers connected to good quality institutions and the incentive mechanisms activated by them is one of the main channels through which macroeconomic factors positively impact on the business environment, investment climate and competitiveness, indicating to policy makers a strategic tool (i.g. institutional and regulatory reform, especially about Government Effectiveness, Rule of Law and Voice and Accountability) to enhance the ability of lagging regions to better exploit development opportunities.

**References**

Agostino M., La Rocca M., La Rocca T. and F. Trivieri (2012). Do local financial and legal systems affect SMEs capital structure?, Economics Bulletin, 32 (1), 260-271.

Agostino M.R., La Rocca M., La Rocca T. and F. Trivieri (2010). Local Financial Development and SMEs Capital Structure, WP SSRN, <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1343136>

Aiello, F., Pupo, V. and F. Ricotta (2014). Explaining TFP at firm level in Italy. Does location matter?, *Spatial Economic Analysis*, 9 (1), 51-70.

Arellano, M. and S. Bond (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations, *Review of Economic Studies*, 58 (2), 277–297.

Arellano, M. and O. Bover (1995). Another look at the instrumental variable estimation of error components models, *Journal of Econometrics*, 68, 29–5.

Aron, J. (2000). Growth and institutions: A review of the evidence. *The World Bank Research Observer*, 15(1), 1203-1228.

Benfratello, L., Schiantarelli, F. and A. Sembenelli (2008). Banks and innovation: Microeconometric evidence on Italian firms, *Journal of Financial Economics*, 90, 197-217.

Blundell, R. and Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models, *Journal of Econometrics*, 87(1), 115–143.

Carletti, E. (2004). The structure of bank relationships, endogenous monitoring, and loan rates, *Journal of Financial Intermediation*, 13, 1, 58-86.

Cosci, S. and V. Meliciani (2002). Multiple banking relationships: Evidence from the Italian experience. Manchester School Supplement, 37–54.

Cosci, S. and V. Meliciani (2005). Multiple banking relationships and over-leverage in Italian manufacturing firms, Money Macro and Finance Research Group Conference 2005, (87).

Del Monte, A. and A. Giannola (1997). Istituzioni economiche e Mezzogiorno, La Nuova Italia Scientifica, Roma.

Detragiache, E., Garella, E. and L. Guiso (2000). Multiple versus single banking relationships: theory and evidence, *Journal of Finance*, 55, 1133-1161.

Elsas, R., Heinemann, F. and M. Tyrell (2004). Multiple but asymmetric bank financing: the case of relationship lending, CESifo Working Paper Series 1251.

Ferri, G. and M. Messori (2000). Bank-firm relationships and allocative efficiency in northeastern and central Italy and in the South, *Journal of Banking and Finance*, 24, 1067-1095.

Gambini, A. and A. Zazzaro (2013). [Long-lasting bank relationships and growth of firms](https://ideas.repec.org/a/kap/sbusec/v40y2013i4p977-1007.html), [*Small Business Economics*](https://ideas.repec.org/s/kap/sbusec.html), Springer, vol. 40(4), pages 977-1007, May.

Giannola, A., Petraglia, C. and D. Scalera (2016). Net fiscal flows and interregional redistribution in Italy: A long-run perspective (1951-2010), *Structural Change and Economic Dynamics*, 39, pp. 1-16.

Giordano, L., Imbriani, C. and A. Lopes (2013) “Analysis of the Italian Banking System Efficiency: a Stochastic Frontier Approach, in A.G.S. Ventre, A. Maturo, S. Hoskova-Mayerova, J. Kacprzyk (edited by), *Multicriteria and Multiagent Decision Making with Applications to Economic and Social Sciences*, vol. 310 Studies in Fuzziness and Soft Computing; pag. 20-45; Springer-Verlag, Berlin Heidelberg.

Giunta, A. and R. Lagravinese (2016). Local Resilience and Spatial Heterogenity in Italy, forthcoming.

Guiso, L. and R. Minetti (2004). Multiple creditors and information rights: theory and evidence from Us firms, CEPR Discussion Paper 4278.

Hernandez-Canovas, G. and J. Koeter-Kant (2010), The institutional environment and the number of bank relationships: an empirical analysis of European SMEs, *Small Business Economics,* 34, 375-390 .

La Rocca M., La Rocca T. and A. Cairola (2010). The influence of local institutional differences on the capital structure of SMEs: Evidence from Italy, *International small business journal*, 28(3), pp. 234-257.

Lasagni, A., Nifo, A. and G. Vecchione (2015). Firm productivity and institutional quality: Evidence from Italian industry, *Journal of Regional Science*, 55(5), 774-800.

[Mannarino, L., Pupo V. and F. Ricotta](http://www.unical.it/portale/portalmedia/2016-06/WP05_2016.pdf) (2016). Family firms and productivity: the role of institutional quality, WP DESF, No. 5

Masciarelli, F. (2011). The Strategic Value of Social Capital: How Firms Capitalize on Social Assets, Edward Elgar Pub.

Neuberger, D. , Pedergnana, M. , Räthke-Döppner, S. (2008). Concentration of banking relationships in Switzerland: The result of firm structure or banking market structure?, *Journal of Financial Services Research*, 33 (2), pp. 101-126.

Nifo, A., Scalera, D. and G. Vecchione (2016). The rule of law and educational choices. Evidence from Italian regions, *Regional Studies*, DOI 10.1080/00343404.2016.1262945.

Nifo, A. and G. Vecchione (2014). Do institutions play a role in skilled migration? The case of Italy, *Regional Studies*, vol. 48(10), pp. 1628-1649.

Nifo, A., and G. Vecchione (2015). Measuring institutional quality in Italy, *Rivista economica del Mezzogiorno*, N. 1-2, pp. 157-181, Il Mulino, Bologna.

Ongena S. and D.C. Smith (2000). What determines the number of number of bank relationships? Cross-country evidence, *Journal of Financial Intermediation*, 9, 26-56.

Pelliccioni, G. and G. Torluccio (2007). Il rapporto banca-impresa: le determinanti del multiaffidamento in Italia, pp 43-77 chapter of the vol. 74 “Il rapporto banca-impresa in Italia”, by Monferrà Stefano, Bancaria Editrice.

Petersen, M. and R.G. Rajan (1994). The benefits of lending relationships, *Journal of Finance*, 49, 3-37.

Rajan, R.G. (1992). Insiders and outsiders: The choice between informed and arm’s-length debt, *Journal of Finance,* 47(4),1367-1399.

Roodman, D. (2009). How to do xtabond2: An introduction to difference and system GMM in Stata, *Stata Journal*, 9 (1), 86-136, March.

Saaty, T. L. (1980). The Analytic Hierarchy Process. McGraw-Hill, New York, NY.

Sarno, D. (2009). Sviluppo finanziario e crescita economica nel Mezzogiorno, Franco Angeli.

Sharpe, S.A. (1990). Asymmetric information, bank lending, and implicit contracts: A stylized model of customer relationships, *Journal of Finance* 45(4), 1069−1087.

Sierra, G.E., Talmor, E., Wallace, J.S. (2006). An examination of multiple governance forces within bank holding companies, *Journal of Financial Services Research*, 29 (2), pp. 105-123.

Yosha, O. (1995). Disclosure costs and the choice of financing source, *Journal of Financial Intermediation*, 4, 3–20.

**Fig. 1. Average Institutional Quality Index (IQI) in the Italian provinces**



**Fig.2 Average number of bank relationships in the Italian provinces**

**Tab. 1. Summary statistics**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Variables** | **Description** | **Years** | **Obs** | **Mean** | **SD** | **Min** | **Max** |
| NBANK | Number of bank relationships per firm | 2003-2006 | 14433 | 4.784 | 2.986 | 0 | 15 |
| EMP | Number of firm’s employees | 2003-2006 | 14862 | 45.399 | 45.124 | 0 | 250 |
| AGE | Current year – year of foundation (years) | 2003-2006 | 14981 | 25.624 | 19.531 | 0 | 110 |
| INPP | Dummy =1 if firm innovations in product/ process, 0 otherwise | 2003-2006 | 15250 | .583 | .493 | 0 | 1 |
| INORG | Dummy =1 if firm makes product/ process innovations, 0 otherwise | 2003-2006 | 15250 | .172 | .378 | 0 | 1 |
| HT | Dummy =1if firm belongs HiTech sector, 0 otherwise | 2003-2006 | 15254 | .043 | .203 | 0 | 1 |
| INTAS | Intangible Fixed Assets/ tot.assets (%) | 2003-2006 | 14994 | 2.367 | 4.331 | 0 | 25.45 |
| TGAS | Tangible Fixed Assets/ tot.assets (%) | 2003-2006 | 14774 | 20.996 | 15.871 | .579 | 67.30 |
| LEVER | Financial liabilities/(Financial liabilities+equity) (%) | 2003-2006 | 14994 | 27.605 | 32.643 | 0 | 96.39 |
| BANKD | Bank debt/total debt (in %) | 2003-2006 | 14773 | 20.269 | 24.155 | 0 | 77.16 |
| QUICK | Current asset - inventories/ current liabilities | 2003-2006 | 14990 | 1.075 | .939 | .233 | 21.57 |
| LIQUI | Current asset/ current liability | 2003-2006 | 14770 | 1.480 | 1.157 | .506 | 26.52 |
| FIND | Equity/ total liabilities (in %) | 2003-2006 | 14774 | 25.467 | 18.448 | 1.076 | 78.20 |
| GROUP | Dummy =1if the firm belongs to a group, 0 otherwise. | 2003-2006 | 15250 | .172 | .377 | 0 | 1 |
| CONS | Dummy =1if firm belongs to a consortium, 0 otherwise | 2003-2006 | 15133 | .038 | .192 | 0 | 1 |
| COOP | Dummy =1if the firm is co-operative, 0 otherwise | 2003-2006 | 15107 | .012 | .111 | 0 | 1 |
| EXP | Dummy =1if the firm has exported, 0 otherwise | 2003-2006 | 15245 | .620 | .485 | 0 | 1 |
| CRED | Dummy =1 if more credit is wished at the same interest rate, 0 otherwise | 2003-2006 | 12755 | .059 | .237 | 0 | 1 |
| DURAT | Duration of the relationship with the main bank(in years) | 2003,2006 | 12054 | 15.999 | 11.422 | 0 | 53 |
| MAIN | Share of the debt hold by the main bank (in %) | 2003,2006 | 9649 | 24.495 | 24.402 | 0 | 100 |
| BRANCH | Number of branches for province/ provincial population | 2003-2006 | 15254 | 6.433 | 1.473 | 2.193 | 10.49 |
| RGDPC | Provincial real GDP (per capita)(in thousands of €) | 2003-2006 | 15254 | 20217.37 | 4033.258 | 9086.10 | 27414.37 |
| IQI | Institutional quality index at the provincial level | 2004-2006 | 14368 | .711 | .148 | 0 | 1 |
| IQI\_REG | Institutional quality index at the regional level | 2004-2006 | 14638 | .709 | .138 | .0973 | .932 |
| RULAW | IQI Dimension, Rule of Law at the provincial level | 2004-2006 | 14368 | .590 | .164 | 0 | 1 |
| GOVERN | IQI Dimension, Government at the provincial level | 2004-2006 | 14368 | .422 | .133 | 0 | 1 |
| REGUL | IQI Dimension, Regulatory Quality at the provincial level | 2004-2006 | 14368 | .620 | .173 | 0 | 1 |
| VOICE | IQI Dimension, Voice & Accountability at the provincial level | 2004-2006 | 14368 | .505 | .218 | 0 | 1 |
| CORR | IQI Dimension, Corruption at the provincial level | 2004-2006 | 14368 | .849 | .142 | 0 | 1 |

**Tab. 2. Number of bank relationships by region**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Region** | **Mean** | **Sd** | **Median** | **min** | **max** | **1** | **2** | **3-7** | **> 7** | **total** |
| **Piedmont** | 4.562 | 3.046 | 4 | 1 | 15 | 8.27% | 20.21% | 58.36% | 13.16% | 100.00% |
| **Valle D’Aosta** | 3.625 | 2.163 | 4.5 | 1 | 6 | 37.50% | 0.00% | 62.50% | 0.00% | 100.00% |
| **Lombardy** | 4.947 | 3.040 | 4 | 1 | 15 | 6.26% | 14.16% | 62.36% | 17.22% | 100.00% |
| **Trentino A.A.** | 4.262 | 3.159 | 3 | 1 | 15 | 9.45% | 22.44% | 59.06% | 9.06% | 100.00% |
| **Veneto** | 4.870 | 2.681 | 4 | 1 | 15 | 4.93% | 11.57% | 66.37% | 17.13% | 100.00% |
| **Friuli V.G.** | 5.406 | 2.894 | 5 | 1 | 15 | 4.00% | 9.71% | 66.10% | 20.19% | 100.00% |
| **Liguria** | 4.914 | 3.196 | 4 | 1 | 15 | 10.40% | 12.14% | 61.85% | 15.61% | 100.00% |
| **Emilia Romagna** | 5.489 | 3.242 | 5 | 0 | 15 | 5.81% | 9.92% | 61.33% | 22.95% | 100.00% |
| **Tuscany** | 5.212 | 2.804 | 5 | 1 | 15 | 5.98% | 9.25% | 66.07% | 18.70% | 100.00% |
| **Umbria** | 6.501 | 3.628 | 6 | 1 | 15 | 2.04% | 5.10% | 58.16% | 34.69% | 100.00% |
| **Marche** | 5.297 | 2.845 | 5 | 1 | 15 | 6.95% | 7.44% | 65.38% | 20.22% | 100.00% |
| **Lazio** | 4.349 | 3.136 | 4 | 1 | 15 | 8.76% | 24.09% | 54.01% | 13.14% | 100.00% |
| **Abruzzo** | 5.197 | 3.108 | 5 | 1 | 15 | 7.28% | 10.92% | 60.92% | 20.87% | 100.00% |
| **Molise** | 4.375 | 3.252 | 3 | 1 | 12 | 6.25% | 25.00% | 50.00% | 18.75% | 100.00% |
| **Campania** | 4.379 | 2.705 | 4 | 1 | 15 | 9.09% | 16.26% | 63.11% | 11.54% | 100.00% |
| **Puglia** | 4.668 | 3.111 | 4 | 1 | 15 | 12.13% | 12.13% | 58.20% | 17.53% | 100.00% |
| **Basilicata** | 3.465 | 1.084 | 4 | 1 | 5 | 7.50% | 7.50% | 85.00% | 0.00% | 100.00% |
| **Calabria** | 3.047 | 1.690 | 3 | 1 | 7 | 11.54% | 34.62% | 53.85% | 0.00% | 100.00% |
| **Sicily** | 4.674 | 3.679 | 4 | 1 | 15 | 13.18% | 13.18% | 55.74% | 17.91% | 100.00% |
| **Sardinia** | 3.847 | 2.424 | 3 | 1 | 15 | 11.11% | 16.67% | 66.67% | 5.56% | 100.00% |
| **Italy** | 4.963 | 3.024 | 4 | 0 | 15 | 6.76% | 13.30% | 62.40% | 17.54% | 100.00% |

**Tab. 3. Number of bank relationships by class of employees**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Employees** | **Mean** | **sd** | **median** | **min** | **max** | **1** | **2** | **3-7** | **> 7** | **Total** |
| **1-9** | 3.038 | 2.160 | 2 | 1 | 13 | 30.87% | 32.10% | 30.76% | 6.26% | 100.00% |
| **10-49** | 4.395 | 2.471 | 4 | 0 | 15 | 8.25% | 19.13% | 59.36% | 13.27% | 100.00% |
| **50-250** | 6.341 | 3.472 | 6 | 1 | 15 | 3.85% | 8.44% | 51.43% | 36.29% | 100.00% |

**Tab. 4. Bank relationships and regional IQI: overall indicator and sub-indexes**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Region** | **NBANK** |  | **IQI\_Reg** | **CORR** | **GOVERN** | **REGUL** | **RULAW** | **VOICE** |
| **Piedmont** | 4.567 |   | 0.720 | 0.911 | 0.431 | 0.589 | 0.636 | 0.444 |
| **Valle D’Aosta** | 3.625 |  | 0.770 | 0.852 | 0.311 | 0.785 | 0.748 | 0.594 |
| **Lombardy** | 4.950 |  | 0.788 | 0.810 | 0.510 | 0.637 | 0.567 | 0.635 |
| **Trentino A.A.** | 4.264 |  | 0.840 | 0.929 | 0.446 | 0.854 | 0.766 | 0.455 |
| **Veneto** | 4.870 |  | 0.700 | 0.927 | 0.452 | 0.712 | 0.559 | 0.408 |
| **Friuli V.G.** | 5.417 |  | 0.715 | 0.771 | 0.516 | 0.562 | 0.500 | 0.375 |
| **Liguria** | 4.931 |  | 0.519 | 0.760 | 0.394 | 0.410 | 0.313 | 0.571 |
| **Emilia Romagna** | 5.489 |  | 0.718 | 0.963 | 0.429 | 0.759 | 0.474 | 0.589 |
| **Tuscany** | 5.213 |  | 0.880 | 0.913 | 0.451 | 0.722 | 0.854 | 0.518 |
| **Umbria** | 6.493 |  | 0.672 | 0.959 | 0.331 | 0.577 | 0.672 | 0.425 |
| **Marche** | 5.284 |  | 0.661 | 0.895 | 0.299 | 0.675 | 0.635 | 0.432 |
| **Lazio** | 4.360 |  | 0.638 | 0.825 | 0.239 | 0.367 | 0.691 | 0.546 |
| **Abruzzo** | 5.216 |  | 0.620 | 0.845 | 0.172 | 0.578 | 0.822 | 0.383 |
| **Molise** | 4.375 |  | 0.337 | 0.645 | 0.068 | 0.385 | 0.506 | 0.316 |
| **Campania** | 4.399 |  | 0.328 | 0.412 | 0.199 | 0.231 | 0.546 | 0.200 |
| **Puglia** | 4.670 |  | 0.463 | 0.763 | 0.244 | 0.287 | 0.598 | 0.274 |
| **Basilicata** | 3.450 |  | 0.477 | 0.698 | 0.182 | 0.353 | 0.659 | 0.304 |
| **Calabria** | 3.154 |  | 0.125 | 0.511 | 0.156 | 0.156 | 0.147 | 0.170 |
| **Sicily** | 4.723 |  | 0.278 | 0.639 | 0.166 | 0.262 | 0.383 | 0.225 |
| **Sardinia** | 3.847 |  | 0.404 | 0.782 | 0.171 | 0.454 | 0.428 | 0.443 |
| **Italy** | 4.969 |   | 0.709 | 0.850 | 0.423 | 0.620 | 0.590 | 0.506 |

**Tab. 5. Correlation Matrix**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | NBANK | IQI\_REG | IQI | CORR | GOVERN | REGUL | RULAW | VOICE |
| NBANK | 1 |  |  |  |  |  |  |  |
| IQI\_REG | 0.046 | 1 |  |  |  |  |  |  |
| IQI | 0.041 | 0.926 | 1 |  |  |  |  |  |
| CORR | 0.053 | 0.475 | 0.435 | 1 |  |  |  |  |
| GOVERN | 0.026 | 0.617 | 0.699 | 0.153 | 1 |  |  |  |
| REGUL | 0.050 | 0.637 | 0.627 | 0.510 | 0.333 | 1 |  |  |
| RULAW | 0.011 | 0.353 | 0.349 | 0.325 | -0.158 | 0.047 | 1 |  |
| VOICE | 0.010 | 0.404 | 0.486 | -0.094 | 0.405 | 0.372 | -0.405 | 1 |

**Tab.6. Effect of IQI on Multiple Banking Relationships**

|  |  |  |
| --- | --- | --- |
|  | **COLUMN 1 - IQI****(NO RGDPC)** | **COLUMN 2- IQI\_REG****(NO RGDPC)** |
|  | **PROBITa** | **POISSONb** | **SYS-GMMb** | **PROBIT a** | **POISSONb** | **SYS-GMMb** |
|  | pooled | panel | pooled | panel |  | pooled | panel | pooled | panel |  |
| ***Institutions*** |  |  |  |   |  |  |  |  |  |  |
| IQI / IQI\_REG | -0.106\*\* | -0.062\*\*\* | -1.220\* | -0.183 | -1.710\*\*\* | -0.231\*\*\* | -0.022 | -2.283\*\*\* | -0.327 | -3.612\*\* |
|  | *0.045* | *0.006* | *0.061* | *0.429* | *0.001* | *0.000* | *0.268* | *0.001* | *0.281* | *0.022* |
| ***Firm’s characteristics*** |  |  |  |  |  |  |  |  |  |  |
| EMP | 0.048\*\*\* | 0.036\*\*\* | 0.704\*\*\* | 0.137\*\*\* | 0.243\*\*\* | 0.048\*\*\* | 0.022\*\*\* | 0.704\*\*\* | 0.137\*\*\* | 0.540\*\*\* |
|  | *0.000* | *0.000* | *0.000* | *0.000* | *0.002* | *0.000* | *0.001* | *0.000* | *0.000* | *0.000* |
| AGE | 0.039\*\*\* | 0.028\*\*\* | 0.253\*\*\* | 0.051\*\*\* | -0.036 | 0.039\*\*\* | 0.016 | 0.253\*\*\* | 0.051\*\*\* | -0.004 |
|  | *0.000* | *0.000* | *0.000* | *0.000* | *0.551* | *0.000* | *0.008\*\*\** | *0.000* | *0.000* | *0.960* |
| LEVER | 0.002\*\*\* | 0.001\*\*\* | 0.026\*\*\* | 0.005\*\*\* | 0.008\*\*\* | 0.002\*\*\* | 0.001\*\*\* | 0.026\*\*\* | 0.005\*\*\* | 0.015\*\*\* |
|  | *0.000* | *0.000* | *0.000* | *0.000* | *0.009* | *0.000* | *0.000* | *0.000* | *0.000* | *0.000* |
| INTAS | 0.002 | 0.0004 | 0.018\* | 0.004\* | -0.005 | 0.002 | 0.0002 | 0.018\* | 0.004\* | -0.005 |
|  | *0.168* | *0.419* | *0.062* | *0.058* | *0.634* | *0.169* | *0.646* | *0.062* | *0.058* | *0.741* |
| QUICK | -0.024\*\*\* | -0.008\*\*\* | -0.235\*\* | -0.039\*\*\* | -0.0311 | -0.024\*\*\* | -0.007\*\*\* | -0.235\*\* | -0.039\*\*\* | -0.039 |
|  | *0.001* | *0.000* | *0.013* | *0.000* | *0.633* | *0.001* | *0.001* | *0.013* | *0.000* | *0.678* |
| GROUP | -0.012 | -0.009 | -0.091 | -0.021 | 0.0310 | -0.012 | -0.008 | -0.092 | -0.021 | -0.001 |
|  | *0.499* | *0.267* | *0.536* | *0.364* | *0.881* | *0.498* | *0.143* | *0.534* | *0.360* | *0.995* |
| CONS | -0.003 | -0.009 | 0.146 | 0.019 | 0.0641 | -0.003 | 0.0004 | 0.148 | 0.019 | -0.031 |
|  | *0.930* | *0.433* | *0.600* | *0.687* | *0.700* | *0.931* | *0.974* | *0.597* | *0.685* | *0.882* |
| HT | 0.102\*\*\* | 0.060\*\*\* | 1.048\*\*\* | 0.151\*\* | 0.382\*\*\* | 0.102\*\*\* | 0.055\* | 1.047\*\*\* | 0.151\*\* | 0.616\*\*\* |
|  | *0.006* | *0.007* | *0.000* | *0.019* | *0.007* | *0.006* | *0.053* | *0.000* | *0.019* | *0.008* |
| INORG | 0.023 | 0.010 | 0.197\*\* | 0.026 | 0.101 | 0.023 | 0.004 | 0.197\*\* | 0.026 | 0.0738 |
|  | *0.247* | *0.310* | *0.048* | *0.185* | *0.452* | *0.247* | *0.409* | *0.048* | *0.185* | *0.660* |
| INPP | 0.028\*\* | 0.017\*\*\* | 0.266\*\*\* | 0.045\*\*\* | 0.194 | 0.028\*\* | 0.011\*\* | 0.266\*\*\* | 0.045\*\*\* | 0.279\* |
|  | *0.024* | *0.002* | *0.005* | *0.008* | *0.132* | *0.024* | *0.019* | *0.004* | *0.008* | *0.085* |
| EXP | 0.034\*\* | 0.030\*\*\* | 0.461\*\*\* | 0.087\*\*\* | 0.237 | 0.033\*\* | 0.017\*\* | 0.461\*\*\* | 0.087\*\*\* | 0.391 |
|  | *0.049* | *0.000* | *0.000* | *0.000* | *0.272* | *0.049* | *0.008* | *0.000* | *0.000* | *0.163* |
| COOP | -0.040 | -0.031 | 0.051 | -0.010 | -0.078 | -0.040 | -0.026 | 0.053 | -0.009 | 0.129 |
|  | *0.584* | *0.142* | *0.929* | *0.910* | *0.701* | *0.586* | *0.197* | *0.926* | *0.913* | *0.649* |
| NBANK\_l |  |  |  |  | 0.732\*\*\* |  |  |  |  | 0.488\*\*\* |
|  |  |  |  |  | *0.000* |  |  |  |  | *0.000* |
| ***Bank-firm relationships characteristics*** |  |  |  |  |  |  |  |  |  |  |
| CRED | -0.001 | -0.0003 | 0.644\*\*\* | 0.097\*\*\* | 0.162 | -0.001 | -0.002 | 0.644\*\*\* | 0.097\*\*\* | 0.016 |
|  | *0.979* | *0.978* | *0.000* | *0.001* | *0.365* | *0.979* | *0.742* | *0.000* | *0.001* | *0.944* |
| DURAT | 0.000 | 0.000 | 0.002 | 0.0001 | 0.00273 | 0.000 | 0.0001 | 0.002 | 0.000 | -0.002 |
|  | *0.867* | *0.985* | *0.756* | *0.640* | *0.668* | *0.865* | *0.826* | *0.753* | *0.636* | *0.861* |
| MAIN | -0.000 | -0.00003 | -0.006\*\*\* | -0.001\*\* | -0.0037 | -0.000 | -0.0001 | -0.006\*\*\* | -0.001\*\* | -0.0001 |
|  | *0.418* | *0.642* | *0.001* | *0.016* | *0.298* | *0.417* | *0.290* | *0.001* | *0.016* | *0.960* |
| ***Context characteristics*** |  |  |  |  |  |  |  |  |  |  |
| BRANCH | -0.034 | 0.012\*\*\* | -0.426 | -0.039 | 0.0546\* | -0.039 | 0.005 | -0.420 | -0.038 | 0.180 |
|  | *0.576* | *0.000* | *0.194* | *0.714* | *0.079* | *0.492* | *0.031* | *0.216* | *0.719* | *0.350* |
| Constant |  |  |  |  | 0.814\*\* |  |  |  |  | 0.339 |
|  |  |  |  |  | *0.029* |  |  |  |  | *0.752* |
| PROVINCIAL FE | YES | NO | YES | YES | YES | YES | NO | YES | YES | YES |
| N | 5687 | 5687 | 5687 | 5687 | 6,381 | 5687 | 5687 | 5687 | 5687 | 6,381 |
| Number of id |  |  |  |  | 2,812 |  |  |  |  | 2,812 |
| Log pseudolikelihood | *-2105.878* | *-1180.414* | *-12256.36* | *-11780.62* |  | *-2105.5556* | *-1191.9989*  | *-12431.423* | *-11780.36* |  |
| Likelihood-ratio test of alpha=0 |  |  | *1.11**0.146* |  |  |  |  | *1.11**0.146* |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
| AB test for AR(1) |  |  |  |  | -8.547*0.000* |  |  |  |  | -7.937*0.000* |
| AB test for AR(2) |  |  |  |  | -0.967*0.333* |  |  |  |  | -1.097*0.273* |
| Hansen test |  |  |  |  | 295.2*0.160* |  |  |

|  |
| --- |
|  |
|  |

 |  | 261.9*0.627* |
| Difference-in-Hansen tests |  |  |  |  | 30.00*0.224* |  |  |  |  | 52.88*0.088* |
| *\*\*\*, \*\*, \** indicates statistical significance at the 1%, 5%, and 10% level respectively*.* For the description of the variables see Table 1. In italics are reported the p-values of the tests. aThe dependent variable is a dummy coded 1 if firms maintain a number of banking relationships greater or equal two, zero otherwise. bThe dependent is the number of banking relationships for a firm. For the Probit and Poisson regressions the marginal effects are reported. The standard errors (not reported) are clustered at province (NUTS3) level and consistent in the presence of any pattern of heteroskedasticity.To avoid the influence of potential outliers, we winsorize some variables at 1% level. In performing the Probit and Poisson regressions, all potential endogenous and predetermined variables are lagged one year. EMPLOY and AGE are in logarithms. All estimations include ATECO sector dummies, provincial and year fixed effects. We report the AB test for AR(1) and AB test for AR(2) stand for Arellano-Bond test for AR(1) in first differences and Arellano-Bond test for AR(2) in first differences, respectively. The null hypothesis of the Hansen test is that the over-identifying restrictions are valid. The null hypothesis of the difference in Hansen test is that the additional instruments used by the SYS-GMM estimator are valid. |

**Tab. 7. Effect of IQI Sub-indexes on Multiple Banking Relationships**

|  |  |  |
| --- | --- | --- |
|  | **COLUMN 1 - Provincial Level****(NO RGDPC)** | **COLUMN 2 - Regional Level****(NO RGDPC)** |
|  | **PROBITa** | **POISSONb** | **SYS-GMMb** | **PROBIT a** | **POISSONb** | **SYS-GMMb** |
|   | pooled | panel | pooled | panel |  | pooled | panel | pooled | panel |  |
|   |   |   |   |   |  |  |  |  |  |  |
| GOVERN | -0.031 | -0.059\*\* | -1.360\*\* | -0.152\* | -1.420\*\*\* | -0.117\* | -0.032 | -2.573\*\*\* | -0.375 | -3.626\* |
|  | *0.576* | *0.025* | *0.012* | *0.054* | *0.0002* | *0.069* | *0.346* | *0.000* | *0.206* | *0.059* |
| RULAW | -0.115\*\*\* | 0.027 | -0.358 | -0.011 | -0.114 | -0.212\*\*\* | -0.023 | -0.765\* | -0.082 | -0.628 |
|  | *0.002* | *0.104* | *0.328* | *0.945* | *0.601* | *0.000* | *0.246* | *0.090* | *0.695* | *0.336* |
| VOICE | 0.007 | -0.080\*\*\* | 0.349 | 0.054 | 0.382 | -0.194\* | -0.045\* | 0.824 | 0.063 | -1.112 |
|  | *0.912* | *0.000* | *0.356* | *0.821* | *0.322* | *0.08* | *0.058* | *0.285* | *0.873* | *0.368* |
| REGUL | 0.049 | -0.019 | 0.364 | -0.047 | -2.187\*\* | 0.300 | -0.014 | 0.168 | -0.106 | -0.519 |
|  | *0.523* | *0.392* | *0.641* | *0.883* | *0.014* | *0.138* | *0.624* | *0.928* | *0.876* | *0.483* |
| CORR | -0.055 | -0.003 | 0.477 | -0.012 | -0.667 | -0.056 | -0.002 | 0.533 | 0.04 | -1.135 |
|  | *0.366* | *0.853* | *0.211* | *0.954* | *0.271* | *0.346* | *0.934* | *0.151* | *0.842* | *0.220* |
| PROVINCIAL FE | YES | NO | YES | YES | YES | YES | NO | YES | YES | YES |
| *\*\*\*, \*\*, \** indicates statistical significance at the 1%, 5%, and 10% level respectively*.* For the description of the variables see Table 1. In italics are reported the p-values of the tests. Table 7, column 1 and 2 report the results about IQI sub-indexes at the provincial and regional level, respectively. The full results are available upon request. a The dependent variable is a dummy coded 1 if firms maintain a number of banking relationships greater or equal two, zero otherwise. bThe dependent is the number of banking relationships for a firm. For the Probit and Poisson regressions the marginal effects are reported. The standard errors (not reported) are clustered at province (NUTS3) level and consistent in the presence of any pattern of heteroskedasticity. To avoid the influence of potential outliers, we winsorize some variables at 1% level. In performing the Probit and Poisson regressions, all potential endogenous and predetermined variables are lagged one year. All estimations include ATECO sector dummies, provincial and year fixed effects. The values of the Arellano-Bond tests for autocorrelation in first (AB test AR1) and second differences (AB test AR2) tend to support the assumption of lack of autocorrelation in the errors in levels. The null hypothesis of the Hansen test is that the over-identifying restrictions are valid. The null hypothesis of the difference in Hansen test is that the additional instruments used by the SYS-GMM estimator are valid. |

**Tab. 8. Robustness Checks. Effect of IQI on Multiple Banking Relationships**

|  |  |  |
| --- | --- | --- |
|  | **COLUMN 1****(WITH RGDPC)** | **COLUMN 2****(CENTRE-NORTH WITH RGDPC)** |
|  | **PROBIT a** | **POISSONb** | **SYS-GMMb** | **PROBITa** | **POISSONb** | **SYS-GMMb** |
|   | pooled | panel | pooled | panel |  | pooled | panel | pooled | panel |  |
| ***Institutions*** |  |  |  |   |  |  |  |  |   |  |
| IQI | -0.097\* | -0.022 | -1.225\* | -0.183 | -1.525\*\* | -0.096\* | -0.002 | -1.197\* | -0.179 | -1.608\* |
|   | *0.080* | *0.478* | *0.061* | *0.429* | *0.032* | *0.095* | *0.906* | *0.078* | *0.458* | *0.056* |
| ***Firm’s characteristics*** |  |  |  |  |  |  |  |  |  |  |
| EMP | 0.048\*\*\* | 0.028\*\*\* | 0.704\*\*\* | 0.137\*\*\* | 0.250\*\*\* | 0.045\*\*\* | 0.012\*\*\* | 0.720\*\*\* | 0.139\*\*\* | 0.267\*\*\* |
|   | *0.000* | *0.004* | *0.000* | *0.000* | *0.002* | *0.000* | *0.002* | *0.000* | *0.000* | *0.001* |
| AGE | 0.039\*\*\* | 0.027\*\*\* | 0.253\*\*\* | 0.051\*\*\* | -0.033 | 0.027\*\*\* | 0.009\*\*\* | 0.195\*\*\* | 0.038\*\*\* | -0.053 |
|  | *0.000* | *0.000* | *0.000* | *0.000* | *0.583* | *0.007* | *0.016* | *0.005* | *0.006* | *0.384* |
| LEVER | 0.002\*\*\* | 0.001\*\*\* | 0.026\*\*\* | 0.005\*\*\* | 0.008\*\*\* | 0.002\*\*\* | 0.0005\*\*\* | 0.027\*\*\* | 0.005\*\*\* | 0.005\* |
|   | *0.000* | *0.007* | *0.000* | *0.000* | *0.007* | *0.000* | *0.000* | *0.000* | *0.000* | *0.064* |
| INTAS | 0.002 | 0.001 | 0.018\* | 0.004\* | -0.002 | 0.002 | 0.0003 | 0.019\* | 0.004\* | -0.005 |
|   | *0.171* | *0.277* | *0.062* | *0.058* | *0.815* | *0.259* | *0.426* | *0.076* | *0.061* | *0.615* |
| QUICK | -0.024\*\*\* | -0.006\*\*\* | -0.235\*\* | -0.039\*\*\* | -0.0381 | -0.026\*\*\* | -0.004\*\*\* | -0.255\*\* | -0.041\*\*\* | -0.038 |
|   | *0.001* | *0.000* | *0.013* | *0.000* | *0.559* | *0.002* | *0.017* | *0.023* | *0.000* | *0.508* |
| GROUP | -0.012 | -0.006 | -0.091 | -0.021 | 0.059 | -0.021 | -0.006 | -0.125 | -0.028 | 0.0179 |
|   | *0.497* | *0.480* | *0.536* | *0.364* | *0.766* | *0.246* | *0.193* | *0.417* | *0.265* | *0.930* |
| CONS | -0.003 | -0.009 | 0.146 | 0.019 | 0.0617 | 0.017 | 0.010 | -0.032 | -0.023 | -0.035 |
|   | *0.930* | *0.434* | *0.600* | *0.688* | *0.707* | *0.624* | *0.365* | *0.914* | *0.666* | *0.813* |
| HT | 0.102\*\*\* | 0.054\*\* | 1.048\*\*\* | 0.151\*\* | 0.353\*\* | 0.107\*\*\* | 0.049\*\* | 1.190\*\*\* | 0.180\*\*\* | 0.318\*\* |
|   | *0.006* | *0.024* | *0.000* | *0.019* | *0.013* | *0.004* | *0.017* | *0.000* | *0.007* | *0.026* |
| INORG | 0.023 | 0.004 | 0.197\*\* | 0.026 | 0.099 | 0.019 | 0.001 | 0.187\* | 0.024 | 0.061 |
|   | *0.248* | *0.590* | *0.048* | *0.185* | *0.449* | *0.340* | *0.695* | *0.081* | *0.248* | *0.642* |
| INPP | 0.028\*\* | 0.013\*\* | 0.266\*\*\* | 0.045\*\*\* | 0.191 | 0.030\*\* | 0.007\* | 0.239\*\* | 0.042\*\* | 0.229\* |
|   | *0.024* | *0.020* | *0.005* | *0.008* | *0.134* | *0.029* | *0.089* | *0.022* | *0.020* | *0.086* |
| EXP | 0.033\*\* | 0.027\*\*\* | 0.461\*\*\* | 0.087\*\*\* | 0.197 | 0.031\* | 0.012\*\* | 0.477\*\*\* | 0.090\*\*\* | 0.200 |
|   | *0.049* | *0.004* | *0.000* | *0.000* | *0.362* | *0.088* | *0.031* | *0.000* | *0.000* | *0.343* |
| COOP | -0.040 | -0.044 | 0.051 | -0.010 | -0.0346 | -0.092 | -0.027 | -0.010 | -0.010 | -0.008 |
|   | *0.583* | *0.177* | *0.929* | *0.910* | *0.863* | *0.288* | *0.238* | *0.989* | *0.919* | *0.973* |
| NBANK\_l |  |  |  |  | 0.735\*\*\* |  |  |  |  | 0.762\*\*\* |
|   |  |  |  |  | *0.000* |  |  |  |  | *0.000* |
| ***Bank-firm relationships characteristics*** |  |  |  |  |  |  |  |  |  |  |
| CRED | -0.001 | 0.001 | 0.644\*\*\* | 0.097\*\*\* | 0.155 | -0.004 | -0.002 | 0.595\*\*\* | 0.087\*\*\* | 0.315 |
|   | *0.981* | *0.949* | *0.000* | *0.001* | *0.383* | *0.917* | *0.707* | *0.003* | *0.005* | *0.104* |
| DURAT | 0.000 | -0.0001 | 0.002 | 0.000 | 0.002 | 0.000 | 0.00003 | 0.003 | 0.001 | 0.0005 |
|   | *0.869* | *0.873* | *0.756* | *0.639* | *0.737* | *0.674* | *0.886* | *0.503* | *0.383* | *0.925* |
| MAIN | -0.000 | -0.0001 | -0.006\*\*\* | -0.001\*\* | -0.003 | -0.000 | -0.0001 | -0.008\*\*\* | -0.001\*\*\* | -0.002 |
|   | *0.418* | *0.610* | *0.001* | *0.016* | *0.359* | *0.288* | *0.182* | *0.000* | *0.004* | *0.544* |
| ***Context characteristics*** |  |  |  |  |  |  |  |  |  |  |
| BRANCH | -0.036 | 0.011\* | -0.424 | -0.039 | 0.0338 | -0.035 | 0.006\*\* | -0.407 | -0.034 | -0.048 |
|   | *0.565* | *0.073* | *0.197* | *0.717* | *0.323* | *0.592* | *0.022* | *0.255* | *0.756* | *0.272* |
| RGDPC | -0.140 | -0.070\*\* | 0.078 | 0.012 | 0.355 | -0.208\* | -0.050\*\* | -0.194 | -0.018 | 0.491 |
|   | *0.225* | *0.036* | *0.898* | *0.967* | *0.472* | *0.066* | *0.013* | *0.798* | *0.956* | *0.302* |
| Constant |  |  |  |  | -2.673 |  |  |  |  | -3.230 |
|  |  |  |  |  | *0.545* |  |  |  |  | *0.438* |
| PROVINCIAL FE | YES | NO | YES | YES | YES | YES | NO | YES | YES | YES |
| N | 5687 | 5687 | 5687 | 5687 | 6,381 | 5011 | 5011 | 5011 | 5011 | 5,611 |
| Number of id |  |  |  |  | 2,812 |  |  |  |  | 2,476 |
| Log pseudolikelihood | *-2105.656* | *-1183.236* | *-12256.36* | *-11780.63* |  | *-1855.853* | *-1038.690* | *-10820.73* | *-10403.44* |  |
| Likelihood-ratio test of alpha=0  |  |  | *1.11**0.146* |  |  |  |  | *0.53**0.232* |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
| AB test for AR(1)  |  |  |  |  | -8.640*0.000* |  |  |  |  | -8.623*0.000* |
| AB test for AR(2)  |  |  |  |  | -1.008*0.313* |  |  |  |  | -0.416*0.677* |
| Hansen test |  |  |  |  | 300.4*0.418* |  |  |  |  | 291.6*0.561* |
| Difference-in-Hansen tests |  |  |  |  | 26.63 *0.374* |  |  |  |  | 29.09*0.260* |
| *\*\*\*, \*\*, \** indicates statistical significance at the 1%, 5%, and 10% level respectively*.* For the description of the variables see Table 1. In italics are reported the p-values of the tests. a The dependent variable is a dummy coded 1 if firms maintain a number of banking relationships greater or equal two, zero otherwise. bThe dependent is the number of banking relationships for a firm. For the Probit and Poisson regressions the marginal effects are reported. The standard errors (not reported) are clustered at province (NUTS3) level and consistent in the presence of any pattern of heteroskedasticity. To avoid the influence of potential outliers, we winsorize some variables at 1% level. In performing the Probit and Poisson regressions, all potential endogenous and predetermined variables are lagged one year. EMPLOY, AGE, and RGDPC are in logarithms. All estimations include ATECO sector dummies, provincial and year fixed effects. We report the AB test for AR(1) and AB test for AR(2) stand for Arellano-Bond test for AR(1) in first differences and Arellano-Bond test for AR(2) in first differences, respectively. The null hypothesis of the Hansen test is that the over-identifying restrictions are valid. The null hypothesis of the difference in Hansen test is that the additional instruments used by the SYS-GMM estimator are valid. |

**Appendix A.**

**The Institutional Quality Index (IQI)**

The aim of this Appendix is to supply additional details on IQI, i.e. the main explanatory variable of firm’s TFP used in our econometric investigation. The IQI index is inspired to the World Governance Indicator (WGI) proposed by Kaufmann et al. (2011)[[15]](#footnote-16) in the context of the *Knowledge for Change Programme* promoted by the World Bank. The WGI is a complex indicator conceived to measure the quality of governance in 213 countries in the period 1996-2010; it is structured into six dimensions which concern some major quality characteristics of a national system, i.e. i) Voice and accountability, ii) Political stability and absence of violence and terrorism, iii) Government effectiveness, iv) Regulatory quality, v) Rule of law, vi) Control and corruption.

The IQI is constructed following a scheme similar to that of WGI, in particularthe hierarchy framework illustrated in Figure A2, for which each index derives from aggregation of indexes of a lower rank. The main differences between WGI and IQI are that this latter: a) is based on provincial rather than national data; b) considers only five of the six dimensions of the WGI, in so far as the dimension “Political stability and absence of violence and terrorism”, which captures phenomena such as the frequency of coups or terrorist attacks and the presence of the military in politics, is not relevant to the situation in Italian provinces and c) adopts different procedures for weighting, normalization and aggregation of elementary indexes[[16]](#footnote-17).

[Figure A1 – here]

The data we use for the elementary indexes constituting the IQI are released by institutional sources, research institutes and professional registers, and refer to the period 1991-2009. TableA1 reports details of all the elementary indexes used for each dimension: *Voice and accountability* is made up by the participation rate in public elections, the number of associations and of social cooperatives and cultural liveliness measured in terms of books published and purchased in bookshops; *Government effectiveness* measures the endowment of social and economic structures in Italian provinces and the administrative capability of provincial and regional governments in terms of health policies, waste management and environment; *Regulatory quality* concerns the degree of openness of the economy, indicators of business environment, business density and the rate of firms mortality; *Rule of law* summarises data on crime against persons or property, magistrate productivity, trial times, tax evasion and shadow economy; *Corruption* summarises data on a crimes against the Public Administration (PA), the number of local administrations overruled by the federal authorities and the Golden-Picci Index, measuring the corruption level on the basis of “the difference between the amounts of physically existing public infrastructure (...) and the amounts of money cumulatively allocated by government to create these public works” (GOLDEN and PICCI, 2005, p. 37)[[17]](#footnote-18).

[Table A1 – here]

The criterion which steered the choice of elementary indexes, albeit in the framework proposed by WGI, took account of the objectives of the analysis and the actual availability of data on a provincial basis. As regards the reference time period, the values of the elementary indexes are calculated in most cases for the years immediately prior to 2004, consistent with the fact that the data refer to firms total factor productivity measured in 2005-2007. Only very few cases the elementary indexes refer to years after 2004. However, the heterogeneity of the time reference does not pose major problems, insofar as it is reasonable to assume that the processes of institutional change occur slowly, and that appreciable changes in institutional quality take place only in the medium-long term.

The IQI assumes, by construction, values in the range . Table A2 reports the ranking of Italian provinces classified on the IQI basis.

[Table A2 – here]

[Table A3 – here]

**Table A1: Structure of elementary indexes**

|  |  |  |  |
| --- | --- | --- | --- |
| Index | Value | Source (details in notes) | Year |
|  |  |  |  |
| **Voice and accountability** |  |  |  |
| Social cooperatives | Absolute Value1 | ISTAT | 2001 |
| Associations | Absolute Value1 | ISTAT | 2004 |
| Election participation | Turnout %2 | Interior Ministry  | 2001 |
| Books published | Absolute Value3 | ISTAT | 2007 |
| Purchased in bookshops | Index4 | Sole24Ore | 2004 |
|  |  |  |  |
| **Government effectiveness** |  |  |  |
| Endowment of social facilities | Index5 | Tagliacarne | 2001 |
| Endowment of econ. facilities | Index6 | Tagliacarne | 2001 |
| Regional health deficit | Absolute Value7 | MEF and MH | 1997-2004 |
| Separate waste collection | Separate/total8 | Tagliacarne | 2007 |
| Urban environment index | Index9 | Legambiente | 2004 |
|  |  |  |  |
| **Regulatory quality** |  |  |  |
| Economy openness | Index10 | Tagliacarne | 2001 |
| Local government employees | Absolute Value11 | ISTAT | 2003 |
| Business density | Index12 | Tagliacarne | 2008 |
| Business start-ups/mortality | Registration/cessation13 | Tagliacarne | 2003-2004 |
| Business environment | Index14 | Confartigianato | 2009 |
|  |  |  |  |
| **Rule of law** |  |  |  |
| Crimes against property | Absolute Value15 | ISTAT | 2003 |
| Crimes reported | Absolute Value16 | ISTAT | 2003 |
| Trial times | Trial lengths I, II, III17 | Crenos | 1999 |
| Magistrate productivity | MagistrateTrials18 | Ministry of Justice  | 2004-2008 |
| Submerged economyTax evasion | Index19Index20 | ISTATRevenue Agency | 20031998-2002 |
|  |  |  |  |
| **Corruption** |  |  |  |
| Crimes against PA | Index21 | Interior Ministry & ISTAT | 2004 |
| Golden-Picci Index | Index22 | Golden and Picci (2005) | 1997 |
| Special Commissioners | Municipalities overruled23 | Interior Ministry | 1991-2005 |

Notes:1Social cooperatives per 100,000 residents, provincial level. ISTAT: “Le cooperative sociali in Italia” (2006) and “Le organizzazioni di volontariato in Italia” (2005); 22001 general election, provincial level. Interior Ministry: “Archivio storico delle elezioni” <http://elezionistorico.interno.it/> ; 3Books published, in absolute value, provincial level. ISTAT: “La produzione libraia” (2007); 4Purchased books over resident population, provincial level. Il Sole24Ore “Dossier sulla qualità della vita” (2004); 5Includes education, healthcare and leisure facilities, provincial level.Tagliacarne Institute “Atlante di competitività delle province italiane” (2001); 6Includes the following networks: roads, railroads, ports, airports, energy, ICT, banking, provincial level. Tagliacarne Institute “Atlante di competitività delle provincie italiane” (2001); 7Regional health deficit per capita 1997-2004, regional level. Elaboration on Ministry of Economy and Finance and Ministry of Health data from “Relazione generale sulla situazione economica del Paese” (1997-2004); 8Share of separate waste collection on total waste collection, provincial level. Tagliacarne Institute “Atlante di competitività delle province italiane” (2001); 9Includes 25 indexes relative to: air quality, water quality, purification plants, waste management, public transportation, energy consumption, Public parks, Eco management, provincial level. Legambiente “Ecosistema Urbano 2004” (2004); 10Import + Export on the gross domestic product, provincial level. Tagliacarne Institute “Atlante di competitività delle provincie italiane” (2001); 11Public servants over resident population, regional level. ISTAT: “Indicatori statistici sulle amministrazioni centrali e locali” (2003) <http://dati.statistiche-pa.it/> ; 12Number of firms for 100 residents, provincial level. Tagliacarne Institute “Atlante di competitività delle province italiane” (2008); 13Firms registration/mortality, provincial level. Tagliacarne Institute “Atlante di competitività delle province italiane” (2003-2004); 14Includes 39 indexes relative to: entrepreneurship, job Market, tax system, market competition, banking, bureaucracy; public services to firms, firms’ cooperation, provincial level. Confartigianato: “L’indice Confartigianato – Qualità della vita dell’impresa” (2009); 15Number of crimes against property over resident population, provincial level. ISTAT: “Indicatori territoriali per le politiche di sviluppo” (2003); 16Number of crimes reported over resident population, provincial level. ISTAT: “Indicatori territoriali per le politiche di sviluppo” (2003); 17Average length of judicial process, regional level.CRENOS “Data-base on crime and deterrence in the Italian regions (1970-1999)”; 18Number of completed civil and criminal trials for magistrate, regional courts level. Ministry of Justice, statistics: “Graduatoria rispetto agli esauriti per magistrato presente” (2004-2008); 19ISTAT estimation, provincial level.ISTAT: “Le misure dell’economia sommersa secondo le statistiche ufficiali” (2003); 20Based on the difference between the estimated added value by national accounts and tax system (IRAP and individual income tax returns), provincial level. Agenzia delle entrate: “Analisi dell’evasione fondata su dati IRAP, Anni 1998-2002” (2006); 21Number of crimes against the public administration over number of public servants, regional level. ISTAT: “Indicatori territoriali per le politiche di sviluppo” (2004); 22Difference between the amounts of physically existing public infrastructure and the amounts of money cumulatively allocated by government to create these public works, provincial level. Golden and Picci (2005); 23Absolute value of the overruled municipalities on total municipalities, regional level. Interior Ministry: “Relazione sull’attività svolta dalla gestione straordinaria dei Comuni commissariati” (1991-2005).

Table A2: Ranking of provinces by Institutional Quality Index (IQI)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Rankk | Region | Province | Area | IQI |  | Rank | Region | Province | Area | IQI |
| 1 | Tuscany | FIRENZE | Centre | 1 | 55 | Abruzzo | TERAMO | Centre | 0.630 |
| 2 | Tuscany | PISA | Centre | 0.923 | 56 | Abruzzo | CHIETI | Centre | 0.626 |
| 3 | Friuli V. G. | TRIESTE | North | 0.920 | 57 | Marche | MACERATA | Centre | 0.618 |
| 4 | Lombardy | MILANO | North | 0.904 | 58 | Friuli V. G. | UDINE | North | 0.613 |
| 5 | Tuscany | LIVORNO | Centre | 0.900 | 59 | Liguria | LA SPEZIA | North | 0.612 |
| 6 | Tuscany | LUCCA | Centre | 0.870 | 60 | Veneto | ROVIGO | North | 0.605 |
| 7 | Tuscany | SIENA | Centre | 0.856 | 61 | Marche | PESARO URBINO | Centre | 0.588 |
| 8 | Lombardy | VARESE | North | 0.852 | 62 | Abruzzo | L'AQUILA | Centre | 0.583 |
| 9 | Tuscany | PRATO | Centre | 0.852 | 63 | Abruzzo | PESCARA | Centre | 0.573 |
| 10 | Emilia R. | RAVENNA | Centre | 0.812 | 64 | Marche | ASCOLI PICENO | Centre | 0.562 |
| 11 | Tuscany | AREZZO | Centre | 0.809 | 65 | Friuli V. G. | PORDENONE | North | 0.562 |
| 12 | Lombardy | BERGAMO | North | 0.808 | 66 | Veneto | BELLUNO | North | 0.549 |
| 13 | Emilia R. | BOLOGNA | Centre | 0.804 | 67 | Lazio | LATINA | Centre | 0.538 |
| 14 | Emilia R. | RIMINI | Centre | 0.792 | 68 | Puglia | BARI | South | 0.515 |
| 15 | Lombardy | CREMONA | North | 0.792 | 69 | Liguria | IMPERIA | North | 0.502 |
| 16 | Lombardy | LECCO | North | 0.786 | 70 | Sardinia | CAGLIARI | South | 0.473 |
| 17 | Tuscany | MAS-CARRARA | Centre | 0.785 | 71 | Lazio | VITERBO | Centre | 0.458 |
| 18 | Tuscany | PISTOIA | Centre | 0.783 | 72 | Lazio | FROSINONE | Centre | 0.427 |
| 19 | Lombardy | BRESCIA | North | 0.778 | 73 | Lazio | RIETI | Centre | 0.424 |
| 20 | Lombardy | MANTOVA | North | 0.776 | 74 | Basilicata | POTENZA | South | 0.424 |
| 21 | Emilia R. | REGG NELL'EMILIA | Centre | 0.774 | 75 | Puglia | LECCE | South | 0.415 |
| 22 | Piedmont | CUNEO | North | 0.770 | 76 | Sardinia | ORISTANO | South | 0.402 |
| 23 | Emilia R. | PARMA | Centre | 0.769 | 77 | Basilicata | MATERA | South | 0.398 |
| 24 | Tuscany | GROSSETO | Centre | 0.761 | 78 | Puglia | FOGGIA | South | 0.397 |
| 25 | Veneto | PADOVA | North | 0.760 | 79 | Puglia | BRINDISI | South | 0.385 |
| 26 | Emilia R. | FORLÌ-CESENA | Centre | 0.758 | 80 | Puglia | TARANTO | South | 0.383 |
| 27 | Piedmont | NOVARA | North | 0.757 | 81 | Sardinia | SASSARI | South | 0.379 |
| 28 | Piedmont | TORINO | North | 0.738 | 82 | Sardinia | OLBIA-TEMPIO | South | 0.359 |
| 29 | Lombardy | COMO | North | 0.734 | 83 | Campania | SALERNO | South | 0.356 |
| 30 | Lombardy | PAVIA | North | 0.733 | 84 | Campania | AVELLINO | South | 0.326 |
| 31 | Lazio | ROMA | Centre | 0.725 | 85 | Sardinia | MEDIO CAMPID. | South | 0.317 |
| 32 | Veneto | TREVISO | North | 0.723 | 86 | Molise | CAMPOBASSO | South | 0.311 |
| 33 | Valle d'Aosta | VALLE D'AOSTA | North | 0.709 | 87 | Campania | CASERTA | South | 0.295 |
| 34 | Emilia R. | FERRARA | Centre | 0.706 | 88 | Campania | BENEVENTO | South | 0.294 |
| 35 | Friuli V. G. | GORIZIA | North | 0.706 | 89 | Campania | NAPOLI | South | 0.283 |
| 36 | Emilia R. | MODENA | Centre | 0.705 | 90 | Sardinia | NUORO | South | 0.276 |
| 37 | Trentino A.A. | TRENTO | North | 0.701 | 91 | Sicily | MESSINA | South | 0.263 |
| 38 | Piedmont | BIELLA | North | 0.697 | 92 | Sicily | SIRACUSA | South | 0.262 |
| 39 | Umbria | PERUGIA | Centre | 0.697 | 93 | Sicily | RAGUSA | South | 0.253 |
| 40 | Veneto | VICENZA | North | 0.692 | 94 | Sardinia | CARB-IGLES | South | 0.250 |
| 41 | Liguria | SAVONA | North | 0.691 | 95 | Sicily | CATANIA | South | 0.249 |
| 42 | Veneto | VENEZIA | North | 0.689 | 96 | Molise | ISERNIA | South | 0.239 |
| 43 | Liguria | GENOVA | North | 0.686 | 97 | Sicily | TRAPANI | South | 0.228 |
| 44 | Lombardy | SONDRIO | North | 0.686 | 98 | Sicily | PALERMO | South | 0.226 |
| 45 | Veneto | VERONA | North | 0.684 | 99 | Sicily | CALTANISSETTA | South | 0.183 |
| 46 | Piedmont | VERB-CUS-OSS | North | 0.683 | 100 | Calabria | REG DI CALABRIA | South | 0.159 |
| 47 | Emilia R. | PIACENZA | Centre | 0.669 | 101 | Calabria | CATANZARO | South | 0.156 |
| 48 | Marche | ANCONA | Centre | 0.663 | 102 | Calabria | COSENZA | South | 0.154 |
| 49 | Piedmont | ASTI | North | 0.661 | 103 | Sardinia | OGLIASTRA | South | 0.153 |
| 50 | Lombardy | LODI | North | 0.660 | 104 | Sicily | ENNA | South | 0.109 |
| 51 | Piedmont | ALESSANDRIA | North | 0.659 | 105 | Sicily | AGRIGENTO | South | 0.077 |
| 52 | Umbria | TERNI | Centre | 0.645 | 106 | Calabria | CROTONE | South | 0.028 |
| 53 | Piedmont | VERCELLI | North | 0.634 | 107 | Calabria | VIBO VALENTIA | South | 0 |
| 54 | Trentino A.A. | BOLZANO | North | 0.632 |  |  |  |  |  |

Figure A1: Structure of the Institutional Quality Index (IQI)

**Table A3: Descriptives statistics for IQI sub-indexes**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | IQI-Control-corruption | IQI-Govern-ment effectiveness | IQI-Regulatory quality | IQI-Rule of law | IQI-Voice and Accounta-bility | IQI Iindex |
| Mean | 0.7521 | 0.2969 | 0.5055 | 0.6379 | 0.3957 | 0.5632 |
| Standard deviation | 0.1991 | 0.1612 | 0.2135 | 0.2084 | 0.1765 | 0.2355 |
| Coeff. Variation | 0.2647 | 0.5428 | 0.4223 | 0.3267 | 0.4459 | 0.4181 |

Source: Nifo and Vecchione (2014).

1. The term *Mezzogiorno* corresponds to the Southern regions plus the islands, namely Abruzzo, Molise, Campania, Puglia, Basilicata, Calabria, Sicily and Sardinia. [↑](#footnote-ref-2)
2. We consider as multiple banked all firms maintaining a number of bank relationships greater or equal two, roughly corresponding to the tenth percentile of the distribution of the number of bank relationships in our sample. By contrast, Cosci e Meliciani (2002, 2005) consider as multiple banked a firm maintaining a number of bank relationships greater than three and seven, respectively. [↑](#footnote-ref-3)
3. The *hold up* problem may arise in close banking relationships, as the main bank may take advantage from exclusive information and the consequent bargaining power, by practicing interest rates higher than the ones consistent with the real credit worthiness of the firm (Sharpe 1990, Rajan,1992). [↑](#footnote-ref-4)
4. For details on IQI, see Nifo and Vecchione (2014) andhttps://sites.google.com/site/institutionalqualityindex/ <https://sites.google.com/site/institutionalqualityindex/home> to download the dataset. [↑](#footnote-ref-5)
5. As information about the number of lending banks (NBANK), the length of the relationship with the main bank (DURAT), and the share of the firm’s total bank debt held by the main bank (MAIN) is available only for the last year of each survey, we assign the same figure to the previous two years. In the presence of missing or inconsistent values, following Gambini and Zazzaro (2010) and Agostino et al. (2012), we impute suitable values for DURAT by taking the value reported for the last year of the first survey (2000) and adding the number 1 for 2001, the number 2 for 2002 and so on. [↑](#footnote-ref-6)
6. To meet econometrics requirements, we consider only a sample over four years. [↑](#footnote-ref-7)
7. To compare the pooled and the panel estimator, we perform a likelihood-ratio test, showing that panel (Probit and Poisson) estimators are appropriate. [↑](#footnote-ref-8)
8. According to Roodman (2009), the GMM estimator is appropriate when the number of observations is larger than the number of moment conditions. To meet this requirement, we consider a sample over four years assuming that between 2003 and 2004 the value of IQI remains unchanged. This may be acceptable considering that “ *the process of institutional change occurs slowly, and appreciable changes in institutional quality occur only in the medium to long-term*” (Nifo and Vecchione, 2014, pp. 6). For consistency, we use the same sample for Probit and Poisson regressions too. [↑](#footnote-ref-9)
9. We assess the Probit functional form using parametric and semiparametric methods. [↑](#footnote-ref-10)
10. To economize on space in Table 7 we present all regressions of the above models showing only marginal effects (Probit and Poisson models) and coefficients (SYS-GMM) for IQI subcomponents at provincial and regional level. [↑](#footnote-ref-11)
11. In particular, the sub-indexes: GOVERN is not statistically significant only for the Probit (pooled) regression; RULAW is significant only for the Probit (pooled) regression; VOICE is statistically significant for the Probit panel regression; REGUL is significant only for the SYS-GMM estimator. [↑](#footnote-ref-12)
12. For the first robustness check, the variable IQI is not statistically significant for the Probit and Poisson (panel) regressions. Besides, in all models, the control variables confirm their sign and significance. [↑](#footnote-ref-13)
13. For the second robustness check, the variable IQI is not statistically significant for the Probit and Poisson (panel) regressions. Besides, in all models, the control variables confirm their sign and significance. [↑](#footnote-ref-14)
14. This output is available upon request. [↑](#footnote-ref-15)
15. Kaufmann, A., Kraay D. and Mastruzzi (2011) *The worldwide governance indicators: methodology and analytical issues*, Policy Research Working Paper Series, No. 5430, The World Bank. [↑](#footnote-ref-16)
16. Full technical details on these aspects are given in Nifo A. and Vecchione G. (2014) *Do institutions play a role in skilled migration? The case of Italy*, Regional Studies, doi: <http://dx.doi.org/10.1080/00343404.2013.835799>. [↑](#footnote-ref-17)
17. Golden M.A. and Picci L. (2005) *Proposal for a new measure of corruption, illustrated with Italian data*, Economics and Politics, 17, 37-75. [↑](#footnote-ref-18)