Banking geography, firm performance and the credit cycle

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ABSTRACT

This paper analyses the link between spatial developments in the banking sector and firm performance focusing on the last Economic Crisis. Using a unique dataset of Italian manufacturing firms and banks from 2006 to 2011, we show that geographical proximity matters for firm performance, but has a different impact during credit booms and busts. What matters the most for increasing firm performance, during the credit boom, is a short distance between headquarters and the local branches (functional distance), whereas during the credit crunch, only the operational proximity of banks to firms become an important driver to increase firm's performance.

Keywords: banking geography; geographical proximity; firm performance; credit cycle

JEL classification: R51, G21, L6, O16

1. Introduction

The spatial diffusion of banks and its consequences for local economies has been studied a lot since the seminal work of Mayer (1988) and Petersen and Rajan (1994) and proposed again in recent times (Arnaudo *et al.*, 2018; Degryse, Matthews and Zhao, 2018; Ferri, Minetti and Murro, 2019).

The renewed interest in the topic is driven by two main aspects. The first relates to the on-going change in the geography of banks, which is described by the deregulation of credit markets, after the ’90, the progress in information and communication technologies, the wave of merger and acquisitions and the closing of branches after the great financial crisis (Alessandrini, Fratianni and Zazzaro, 2009; Martin and Pollard, 2017).

The second relates to the fact that firms, in particular SMEs, rely on the support given by banks and other financial institutions to sustain their growth and technological development. Thus, the surrounding financial environment impacts on firm economic performance, increasing or hampering the capacity of firms to access credit, to obtain loans aimed at promoting investments and innovative projects (Alessandrini, Papi and Zazzaro, 2003). This aspect becomes of vital importance especially during periods of credit contraction, in which the task of lenders becomes more difficult (higher asymmetries) and borrowers are even more in need of financial support to overcome the economic downturn. Geographical proximity, within banks and between banks and borrowers, might be crucial for lenders to better face the uncertainty and information asymmetries related to the process of credit supply (Petersen and Rajan, 2002).

This paper brings together all these aspects focusing on the relation between bank spatial diffusion and firm performance (measured as Return on Assets) during the credit cycle.

Most studies in the literature have constructed two main indicators of geographical spatial diffusion (Alessandrini et al. 2009). The first relates to the presence of bank branches at the local level, an indicator that measures the proximity between banks and borrowers (operational proximity), the second relates to the distance between the branches in the territory and their respective headquarters (functional distance). The main questions regarding the impact of banking geography are the following*:* Does the spatial diffusion of local branches and headquarters matter for local development? Do firms benefit in terms of credit availability and eventually in terms of performance from how the banking sector is distributed geographically?

These questions are not new to the literature. Some papers have analysed the relation between bank proximity and local economic growth (Bernini and Brighi, 2018), product/process development (Benfratello, Schiantarelli and Sembenelli, 2008), the financial stability of small firms (Agostino and Trivieri, 2018), the economic growth of developing countries (Mian, 2006).

Our paper is closely related to Alessandrini et al. 2009, who focus on the role of operational proximity and functional distance on the credit availability of Italian firms during a period of time (1996-2003) characterized by an increase in the number of branches and also at the same time by an increase in the functional distance between headquarters and local branches.

Our paper differs from Alessandrini et al. 2009 in two ways. The first is that we move a step beyond credit availability studying the impact of banks spatial diffusion on the actual performance of firms, trying to shed light on whether the credit market behaves efficiently fostering the better performance of firms. If banks spatial diffusion matters for credit availability (Alessandrini et al. 2009), does the credit market behave efficiently fostering also a better performance of firms?

The second peculiarity is to focus on a substantially different period of time (2006-2011). A period which involves both the apex and the burst of credit developments. After the failure of Lehman Brothers (2008) and the collapse of the whole banking system we assist to a general reduction of credit availability, in particular in those countries where SMEs are the main actors in the economic scenario (Cenni *et al.*, 2015).[1] It is thus interesting to pin down what becomes important, in terms of bank proximity, to promote firms' performance during a credit crunch. Given a higher level of informational asymmetries between banks and borrowers, it is important to shed light on whether bank proximity is a relevant instrument to contrast the counter cyclicality of the economy.

Our result show that the spatial distribution of banks matters also for firm performance. In line with the literature (Brighi and Venturelli, 2016; Aristei and Gallo, 2019) during the credit boom (in the pre-crisis time) we show that firm performance is positively related to

[1] In this period of time, the banking geography has been characterized by a decrease in both operational proximity and functional distance. The number of branches have closed reducing the number of local subsidiaries around 25% in the Eurozone from 2008 to 2016 (European Central Bank, 2017).

a reduced functional distance between the local bank and its headquarter, whereas the physical proximity between lenders and borrowers turns out to be not important.

During the credit bust, though, in a period of credit contraction, what matters for firm performance is the physical proximity between firms and lenders. This result is in line with Beck et al. (2018), Degryse et al. (2018) and contrasts with Zhao and Jones-Evans (2016), who find that a reduced functional distance matters for UK SMEs credit availability, whereas a smaller operational distance between branches and local SMEs turns out to be inconclusive. Their results are based only on the credit crunch period.

The novelty of our work is to study jointly the role of both bank proximity measures comparing, within the same econometric framework, the role of credit booms and busts. Our analysis is based on Italian banks and manufacturing firms over the period 2006 to 2011, characterized by a pre-crisis period 2006, 2007, 2008 (years of credit boom), and a crisis period (years of credit bust). We use a panel database provided by Aida Bureau van Dijk, for what concerns firms characteristics and financial indices, and by the Bank of Italy and ISTAT for bank and territorial information.

We run a set of panel regressions to analyse the impact of operational and functional distance and their interaction with a dummy crisis, to understand how the coefficients are affected by the credit cycle. Our dependent variable is at the firm level, while the operational proximity and functional distance are at the province level. Even if we could use a multilevel strategy, we prefer to treat these variables at the same level and control for province characteristics. We use clustered standard errors at the province level (Huang, 2018). To mitigate for potential endogeneity and omitted variable bias we adopt an

instrumental variable approach following Guiso et al. (2004) and Alessandrini et al. (2009). We use the number of bank branches in 1971 and the number of cooperative banks to instrument geographical proximity and functional distance. Moreover, as far as these instruments are time-invariant, we estimate a random effect model with the Mundlak-Chamberlain correction (Wooldridge, 1995).

The rest of the paper is structured as follows: Section 2 describes the theoretical background and the empirical literature related to credit rationing, banking geography and the economic crisis; Section 3 presents the dataset and the methodology used for the empirical analysis; Section 4 presents the main results and the discussion, while Section 5 concludes.

2. Literature Review

Physical proximity between the borrower and its lending office, is measured by the number of branches at the province level divided by the population. The strong presence of branches at the local level implies that the probability of having a lending office close to each firm is high. Geographical proximity is crucial for lenders that can reduce the informational asymmetries underlying the bank-firm relationship and the transportation costs related to distance (Petersen and Rajan, 2002).

It is true that the development of information technologies (IT) and e-banking services, might have reduced this second advantage, but nevertheless banks often evaluate firms solvability not only implementing a credit scoring approach, but also accounting for the

entire background of "soft" and not codified information typical of SMEs. The latter , in comparison to larger firms, mainly rely on the support given by banks and other financial institutions to sustain their growth and technological development (Presbitero, Udell and Zazzaro, 2014; Antonietti *et al.*, 2015; Zhao and Jones-Evans, 2016). Geographical proximity turns out to be an important aspect to assess the reliability of soft information and to ease the monitoring activities for local banks.

Physical proximity is thus related to the concept of relationship lending, which has been widely studied in the literature and is associated to the long-term and close relation between firms and their lending office.

The literature on relationship lending, is very vast and dates back to the '90 with the seminal theoretical works of Mayer (1988) and Petersen and Rajan (1994), among others. Among the main advantages of relationship lending we can point out the existence of a bank lender, who is able to renegotiate debt contracts and acquire private information which appears to be optimal in particular for informationally opaque borrowers (SMEs, young firms).

Empirically the debate is still ongoing on whether there is a relationship lending advantage. For example, Degryse and Ongena (2005) highlight the effects of the geographical distance between a Belgian bank and its funded firms on loan rates, concluding that the lower is this distance, the lower are the rates paid by the firms due to a decrease in transportation costs, favoured by face-to-face relationships, and informational advantages derived from physical proximity. Similarly, Agarwal and Hauswald (2010) test this relationship in the US, in particular for opaque markets of small firms, which rely primarily on soft information. Their findings demonstrate that geographical proximity increases the transfer of private

information, however it decreases its quality.

While the increase in the number of branches in the territory might be associated to an increase in relationship lending, it might also be associated with a higher degree of credit diversification (Gobbi and Sette, 2013). Given a high number of branches in the territory firms might decide to ask for credit to different lenders. Diversified borrowing has the advantage of enabling firms to reduce the risk that the supply of credit is impeded when one of the lenders is hit by a liquidity shock (Detragiache, Garella and Guiso, 2000). Concentrated borrowing, on the other hand, provides banks with informational rents that increase their capacity to hold up the borrower, charging higher interest rates, requiring more collateral or even denying credit (Sharpe, 1990; Rajan, 1992; Von Thadden, 2004).

Most of the recent literature has showed that in the pre-crisis period, associated with a credit boom, physical proximity did not matter to increase loan approvals (Alessandrini, Fratianni and Zazzaro, 2009; Aristei and Gallo, 2019), but in periods of financial turmoil physical proximity might have a role in reducing the greater informational asymmetries and opacity between lenders and borrowers and reduce the scepticism of banks in approving loans (Bolton *et al.*, 2016). In other words, physical proximity might have in principle a counteractive role in financing and fostering the growth of firms in difficult times (Beck *et al.*, 2018). If the increase in the number of branches is associated to an increase in the diversification of borrowing this might also be important in times of crisis reducing the risk for firms of having a credit shortage (Santos and Winton, 2008).

Close to the operational proximity concept, the functional distance can be considered a proxy of the organizational structure of the local banking system. In recent years many

banking scholars have emphasized the critical role of organizational issues for lending activities (Stein, 2002; Novaes and Zingales, 2004). Information on local borrowers is in the hand of local bank managers and to a large extent this information is soft and not easily transferable to the centres of lending decisions. The higher is the distance between parent bank and local unit, the higher is the risk to have information asymmetries between headquarter and branches and agency problems due to hard dissemination of soft information. Even in this case the geographical proximity between headquarters and local banks still matters even in an ICT dominated world, because of the persistent relevance of tacit knowledge in the process of credit evaluation.

The role of functional distance on credit allocation has been extensively studied, finding a negative relationship between functional distance and credit availability. Some studies focus also on the crisis period, finding a positive role for functional distance in explaining credit availability. Presbitero et al. (2014) and Zhao and Jones-Evans (2016), for example, put in evidence that the severe credit contraction for firms during the crisis, was higher for areas where branches were located far away from their headquarters. Differently from these studies we consider both indicators jointly and the pre-crisis and crisis period within the same model.

3. Data description

The empirical analysis employs an Italian firm-level balance sheet dataset for the period 2006–2011. The sample has been drawn from different sources. For what concerns the bank side, we extract information for branches and headquarters from the Surveillance Office of

the Bank of Italy. For each branch and headquarter the survey reports: the ID code, which connects the headquarter with its branches; the institution type (cooperative credit, industrial, commercial); the address (street and ZIP codes); the foundation year and, if this is the case, the closing date. With this last information, we were able to monitor the closing rates of branches along the period under investigation, to understand the real effect of the economic crisis after 2008.

For province (NUTS3) and regional (NUTS2) characteristics, we collect data from ASTI Istat database, which contains information on the population, the surface, the infrastructures and other territorial indicators.

The third database, related to firm characteristics, is extracted from AIDA databank (Bureau Van Dijk), and it reports balance sheet information of Italian manufacturing firms. We merge the three databases together using the ZIP postal code. In this way each firm can be exactly paired with the banks located in a certain area. After some standard cleaning procedure, such as dropping outliers in the firm's balance sheets and missing values related to the address of the banks or the firms, we end up with a six years unbalanced panel database which comprehends 531 headquarters, 39,229 branches and about 117,000 firms observed for the period under examination.

4. Variables

4.1. Dependent variable and bank proximity indicators

Our dependent variable is Return on Asset (ROA) in levels, as the main indicator for firm performance (Hansen and Wernerfelt, 1989; Drago *et al.*, 2015; Cingano, Manaresi and Sette, 2016).

To derive our bank proximity indicators, we follow Alessandrini et al. (2009). For what concerns the operational proximity index, we compute the ratio between the number of branches in a province *j* over its inhabitants, as follows:

$$\text{OP\_POP}_j = \frac{Branches_j * 10{,}000}{Population_j}$$

It can be considered an Herfindahl Hirschman Index (HHI) of bank concentration at the province level, and it proxies the *betweenness* of banks and borrowers.

The functional distance indicator captures the severity of informational and organizational frictions between the local branch and the headquarter of its parent bank (Alessandrini et al., 2009 and 2010), and it can be considered as a *within* measure among banks. Similarly to Alessandrini et al. (2009), we define the index as flows: for a given province *j* the number of branches in the *j*-th province is f_j, then:

$$\text{Functional Distance}_j = \frac{1}{f_j} \sum_{k=1}^{f_j} \ln(1 + \Delta_k) \text{ where } j = 1, .., 103 .$$

Where Δ_k is the geographical distance between branch *k* and its headquarter. We compute the distance using OpenCage GeoCode, which calculates the exact kilometric distance using the latitude and longitude of each branch and the latitude and longitude of its headquarter.

In comparison to Alessandrini et al. (2009), our methodology can exactly pin down the

actual distance even for branches and headquarters that belong to the same province.

Both operational proximity and functional distance are indicators aggregated at the province level. The number of provinces changes various times between 2006 and 2015, starting from 103 in 2006 and passing to 105 in 2007, and to 110 in 2011. In the analysis we rely on a number of 103 provinces, re-aggregating the data accordingly.

Summary statistics of the two measures and differences between years and geographical specifications are reported in Table 1. The upper part of the table shows a decrease in the mean of both measures from 2006 to 2011. Banks branches have closed, diminishing operational proximity, but also the distance between headquarter and local branch has dropped. The period under exam (2006-2011) saw a drop in operational and functional distance as opposed to the period 1996-2003 considered in Alessandrini et al. 2009. The period 1990 - 2006 was characterized by a process of liberalization of the Italian banking market following the Amato Act (1990) and the Consolidated Banking Act (1993), which has put an end to the old Banking Act of 1936. The period that followed 2006 was, on the contrary, characterized by a sharp decline in the number of branches a stylized fact that could also be generalized to all of Europe and the US. The wave of mergers and acquisitions which followed the liberalization, the Antitrust Auhority intervention to reduce competition and finally the global recession were the three main drivers of this reduction. The middle part of the table shows that the decline has been stronger for operational distance and more pronounced in the north. This result is also confirmed by Figure 1, which shows the number of branches by province in 2006 and 2011 confirming visually the change in the geography of banks during the period considered. Finally the lower part of

Table 1 shows, as expected, that the North is characterized by higher operational proximity and a lower functional distance.

[INSTERT TABLE 1 ABOUT HERE]

[INSTERT FIGURE 1 ABOUT HERE]

In order to study the relation between bank proximity and performance during the credit cycle, we interact both measures with a dummy crisis, equal to 1 for the year 2009- 2010- 2011, 0 otherwise, to account for the presence of a period of credit boom followed by a bust.

4.2. Control variables

For what concerns the control variables, we use different type of controls both at the firm and province level.

At the firm level, we introduce size and industry dummies. In fact, we expect that the bigger is the firm the lower it will be the need to have local banks as sources of finance. Sector controls are reported to take into consideration the characteristics of the industry each firm belongs to. We control for relative market share, computed as the ratio of firm's value added over sector's value added, to account for firm-specific relative competitive advantage (Hansen and Wernerfelt, 1989; Cenni *et al.*, 2015). Finally, we add four geographical dummies at NUTS1 level (Italian Macro regions) to take into account the

economic and financial disparities between North and South of Italy which have emerged also from Figure1.

To control for territorial characteristics, we add different sets of variables to the model. We include the number of branches belonging to the same headquarter at the province level. This variable expresses the presence of a particular bank in each province, and therefore it can be considered as a proxy for credit diversification. The province risk, to measure the reliability of each province to attract and maintain national subsidies (ISTAT, 2018). Summary statistics and the description of the variables are reported in Table 2.

[INSTERT TABLE 2 ABOUT HERE]

5. Econometric Strategy

To understand the impact of geographical proximity and functional distance, we estimate the following equation:

$$y_{ijt} = \beta_0 + \beta_1 operational\ proximity_j + \beta_2 functional\ distance_j + \beta_3 operational\ proximity_j * crisis + \beta_4 functional\ distance_j * crisis + \beta_5 crisis + \beta_6 X_{it} + \alpha_i + \varphi_t + u_{it} \quad (1)$$

We include in the model both measures of banking proximity separately and their interaction with the dummy crisis. We perform various specifications to validate the consistency of the findings. Unfortunately, given the nature of the variables, potential

endogeneity and omitted variables bias can arise from our regressions. To mitigate for these issues, we consider an instrumental variable approach, where our instruments are geographical proximity and functional distance of banks in 1971 and the number of Cooperative banks during the same period. In choosing these instruments that may be correlated with banking development variables but uncorrelated with the error term, we follow Guiso et al. (2004) and exploit the fact that the number of branches in Italian regions and their distributions by size in 1936 were strictly regulated by the Bank of Italy and thus unrelated to regional economic development at the time. The same distribution remained unaltered until the end of 1970s, distribution which is highly correlated with the actual local banking development. Following Guiso et al. (2004), we take these as valid instruments as far as they are uncorrelated with the error term and correlated with the banking variables.

As far as our instruments are time invariant, we implement the Mundlak-Chamberlain correction (Chamberlain 1982), which solves the unobserved heterogeneity problem by including in the otherwise standard RE model, an additional set of time-constant explanatory variables.[2]

6. Results

Table 3 reports the main results. We consider three different sets of results. The first (columns 1, 2, 3) includes only our focal variables, the second (columns 4, 5, 6) includes

[2] Following Mundlak (1978) we compute, for each firm, the average of all time variant variables in equations 1 and 2.

also control variables, the third (columns 7, 8, 9) includes control variables and adopts an instrumental variable approach.

For each set of results we include three different specifications: Pooled OLS, Random Effects, and Fixed Effects. For the instrumental variable setting, we report the Mundlak-Chamberlain correction, instead of the Fixed Effects. Our result can be summarized as follows.

During the credit boom, if we consider the effect of both bank proximity measures jointly, operational proximity does not seem to have a significant role in fostering firms' performance, especially when we account for endogeneity issues.[3] On the other hand functional distance seem to matter. The table shows a negative and significant coefficient across all specifications, implying that a higher distance between headquarter and local bank has a negative impact on the performance of firms. A complex bank organizational structure turns out to be detrimental for firm's ROA. This finding is in line with Alessandrini et al. 2009, which shows the same result during the 1996-2003 period focusing on the relation between bank proximity and credit availability.

During the credit crunch, the role of bank proximity in fostering firms' performance has a different outcome. If we consider the sum of the coefficients, which represent the effect of operational proximity and functional distance when the dummy variable is equal to 1, and reported at the end of the Table, we can immediately notice that, opposite to the credit

[3] The coefficient on operational proximity turns out to be positive only in the first two sets of results which do not account for endogeneity.

boom period, operational proximity and not functional distance seems to have a role in fostering economic performance. In particular, the physical proximity between firms and banks, which was not so relevant before the crisis, becomes important for reducing the information asymmetries, which are during the crisis period at their highest level. This result is in line with Beck et al. (2018), Degryse et al. (2018). During a credit boom, it is important to have an agile organizational structure of the banking system between local and centralized level, in order to foster firm economic development. The higher is the functional distance, the harder it will be to transfer soft information among agents, which translates into slower funding procedures and reduced firm's investments and growth. During the credit bust, what is important is the distance between borrowers and banks.

Functional distance, differently from operational proximity, highlights the information asymmetries and agency costs within the banking institution. A high distance between local bank and headquarter makes the information about borrowers largely asymmetric within the bank organization and provides local loan officers with the opportunity to exploit this informational rent to their own benefit. Besides information and agency problems, the geographical proximity of the "thinking head" of the bank to a region increases the sensitivity of the bank's lending policy to the needs of the local economy and to the lobbying effort of local society (Scharfstein and Stein, 2000; Landier and Thesmar, 2009). Physical proximity, on the other hand puts an accent on the proximity of the operational arm of the banking system to the territory. It is not about making the transmission between local branch and top hierarchical levels of the bank easier, but to increases the opportunity to acquire information about borrowers that is not otherwise available to people external to

the local society. This type of proximity becomes extremely relevant during the crisis period, in which the activities of firms, especially SMEs, become opaque and more difficult to figure out. Another element that could be important to explain this result during the credit crunch, given that a higher concentration of branches locally implies a better firm performance, might be also due to the fact that firms in a territory with a high concentration of local branches are more able to diversify their borrowing activities. Diversified borrowing has the advantage of enabling firms to reduce the risk that the supply of credit is impeded when one of the lenders is hit by a liquidity shock, a highly probable situation during the credit crunch.

[INSTERT TABLE 3 ABOUT HERE]

7. Conclusions

In this paper we study the impact of banks' spatial organization and firms' performance over the period 2006-2011, distinguishing between two main different notions of distance: (i) the operational or borrower-to-branch distance; (ii) the functional or branch-to-headquarter distance.

The main contribution of our study is to fill the gap in the literature on the role of operational and functional distance over firm performance, moving forward from a more general macro-local perspective to the individual firm-level effect over the credit cycle.

During a credit boom, our results show that it is important to have an agile organizational structure of the banking system between local and centralized level, in order to foster firm economic development. The higher is the functional distance, the harder it will be to transfer soft information among agents, which translates into slower funding procedures and reduced firm's investments and growth. During the credit bust, what is important is the distance between borrowers and banks, i.e. the operational distance. Physical proximity puts an accent on the proximity of the operational arm of the banking system to the territory. It is not about making the transmission between local branch and top hierarchical levels of the bank easier, but to increases the opportunity to acquire information about borrowers that is not otherwise available to people external to the local society.

Although one should be careful in extending country-specific results to other contexts, our findings might suggest a more general policy conclusion in particular for what concerns banks and credit management in a period characterized by massive branch closures and by the use of ICT in the relationship between agents.

Removing local branches on one hand, and increasing the organizational layers within the banking structure on the other, turns out to be detrimental for SMEs, which in these conditions, have more difficulties in obtaining funds for their investment purposes. Even if maintaining local branches sparse over the territory might be costly, having a decentralised banking system and establishing face-to-face relationships could be fruitful both for credit institutions and for firms, particularly during credit busts when firms are more opaque but also in need to counteract the economic downturn. A decentralized banking system then becomes a relevant instrument to contrast the counter cyclicality of the economy.

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TABLES

Table 1. Banking distance variables - Summary statistics

	Operational Proximity		Functional Distance	
	Mean	Std. Dev.	Mean	Std. Dev.
Year				
2006	7.493	4.057	4.787	0.757
2007	7.411	3.747	4.718	0.718
2008	6.722	3.611	4.640	0.715
2009	5.543	3.345	4.438	0.667
2010	5.235	3.352	4.345	0.688
2011	4.407	3.014	4.192	0.767
		2006–2011 Growth rates		
	Mean	Std. Dev.	Mean	Std. Dev.
North-West	-0.423	0.174	-0.044	0.061
North-East	-0.515	0.155	-0.181	0.082
Centre	-0.263	0.123	-0.086	0.054
South	-0.397	0.131	-0.130	0.051
Italy	-0.415	0.175	-0.110	0.086
		t-test on the differences between:		
2011 vs. 2006	-2.587***		-.550***	
	(-4.850)		(-4.590)	
North vs South	2.794***		-.636***	
	(252.461)		(-286.131)	

Table 2. Summary statistics

VARIABLES	Source	Description	Mean	Std. Dev.	Min	Max
ROA	AIDA-Bureau van Dijk	Return on Assets	4.935	8.002	-26.28	37.51
Operational Proximity	Bank of Italy	Number of branches over population at province level	5.999	3.665	0.75	26.02
Functional Distance	Bank of Italy	Distance between each subsidiary and its headquarter	4.493	0.749	2.18	6.62
Market Share	AIDA-Bureau van Dijk	Firm's Value Added over sector Value Added	1.006	5.910	0.01	761.17
Province Risk	ISTAT	Risk of the province, computed as the decay of loan rates of banks in each Province	1.878	1.062	0.273	20.18
Bank branches	Bank of Italy	Number of branches of the same headquarter in each province	92.743	138.833	0	692

Table 3. Estimation results (Dep. Var.: ROA)

VARIABLES	(1) Pooled OLS	(2) RE	(3) FE	(4) Pooled OLS	(5) RE	(6) FE	(7) IV-Pooled OLS	(8) IV-RE	(9) IV-RE-Mundlak
Operational Proximity	0.076**	0.071**	0.252***	0.039*	0.047*	0.271***	-0.110*	-0.132*	-0.104
	[0.032]	[0.031]	[0.043]	[0.023]	[0.025]	[0.046]	[0.064]	[0.069]	[0.071]
Functional Distance	-0.359**	-0.366***	-1.266***	-0.165	-0.229*	-1.298***	-0.914**	-0.967**	-0.843**
	[0.161]	[0.137]	[0.285]	[0.138]	[0.125]	[0.270]	[0.385]	[0.417]	[0.414]
Operational Proximity*Crisis	-0.095*	-0.072	-0.017	-0.091	-0.078	-0.011	0.191***	0.201**	0.186**
	[0.057]	[0.057]	[0.049]	[0.056]	[0.057]	[0.045]	[0.070]	[0.081]	[0.076]
Functional Distance*Crisis	0.042	-0.048	-0.002	-0.037	-0.076	0.019	1.400***	1.357**	1.264**
	[0.169]	[0.159]	[0.156]	[0.159]	[0.162]	[0.153]	[0.511]	[0.575]	[0.533]
Crisis	-1.669*	-1.849**	-2.474***	-1.257	-1.541*	-2.400***	-9.534***	-9.738***	-9.335***
	[0.977]	[0.903]	[0.847]	[0.916]	[0.906]	[0.803]	[2.777]	[3.148]	[2.958]
Market Share				0.054***	0.116***	0.409***	0.053***	0.101***	0.403***
				[0.012]	[0.022]	[0.099]	[0.012]	[0.020]	[0.100]
Province Risk				-0.146*	-0.154*	-0.167**	-0.126	-0.173*	-0.207**
				[0.076]	[0.080]	[0.079]	[0.094]	[0.096]	[0.099]
Bank Branches				0.000	-0.000	-0.001***	-0.000	-0.000*	-0.000
				[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Size dummies	NO	NO	NO	YES	YES	YES	YES	YES	YES
Year dummies	NO	NO	NO	NO	NO	NO	NO	NO	NO
Industry dummies	NO	NO	NO	YES	YES	NO	YES	YES	YES
Geographical dummies	NO	NO	NO	YES	YES	NO	YES	YES	YES
Constant	7.138***	7.577***	10.478***	4.973***	5.819***	10.449***	9.511***	11.311***	6.380**
	[0.876]	[0.708]	[1.194]	[0.849]	[0.772]	[1.142]	[2.393]	[2.556]	[2.588]
Observations	416,106	416,106	416,106	416,106	416,106	416,106	393,309	359,860	393,309
R-squared	0.017	0.055	0.056	0.033	0.061	0.067	0.030	0.060	
Hansen-J test (p-value)							0.824	0.388	0.917
Wald χ^2							30.04	24.88	21.15
Number of instruments							6	6	6
Op. Prox.+ Op. Prox* Crisis	-0.019	0.001	0.234***	-0.051	-0.030	0.260***	0.0813***	0.069**	0.082**
	[0.035]	[0.039]	[0.069]	[0.042]	[0.042]	[0.070]	[0.030]	[0.032]	[0.029]
Funct.Dist.+ Funct.Dist.*Crisis	-0.316***	-0.414***	-1.267***	-0.202**	-0.305***	-1.279***	0.486*	-0.389	-0.421
	[0.104]	[0.133]	[0.327]	[0.090]	[0.134]	[0.324]	[0.283]	[0.323]	[0.271]

*** p<0.01, ** p<0.05, * p<0.10. Clustered standard errors a at NUTS3 regional level in parentheses

FIGURES

Figure 1. Banks density over time.