

Do Geographical distance and diversification really matter for bank market power?

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Version: September 2011

Abstract

Using a large sample of Italian banks over the period 2006-2008, this paper provides new evidence for the effect of the geographic distance between bank's headquarters and its branches; and furthermore for firm's characteristics, such as diversification strategies, risk exposure, ability to control the internal costs on competition and market's characteristics, such as GDP, market share, and the number of foreign-owned branches. Working from the translog cost function, we employ the Lerner Index as a measurement of a bank's market power. Our findings suggest that cost efficiency, geographical distance, and diversification strategies are crucial to explain differences in the monopoly market power. Focusing on the market characteristics, the Lerner Index seems to be related to the number of potential foreigner competitors, and finally by macroeconomic variables, such as the Gross Domestic Product (GDP).

JEL Classification: G2, L1, C23

Keywords: Lerner Index, Distance, Bank

1. Introduction

Recent literature has extensively investigated the impact of regulatory and structural changes on competition in the financial market (e.g., Carbò et al. 2009, Bikker and Haaf, 2002). The implementation of international accounting reforms, the deregulation of financial services in the European Union, and the globalization process have all contributed to an alteration of the market structure and the banking competitive viability, substantially reducing the existent barriers to entry. In this context several banks exploited diversification strategies and diversified business models in order to enhance their performance and market power. In the banking and finance literature there is no common agreement on the main results attained from diversification. Competitive pressure has pushed banks to diversify their own revenue sources and to increase their non-interest income sources, such as bank assurance and off-balance sheet business, which generates fees and commission income as a consequence of the enlargement of the competitive pressure, as argued by Goddard et al (2007). The exploitation of diversification strategies has assumed a relevant role for the competitive viability of banks, although diversification may not directly enhance profitability. In this context, a bank's organizational form and the type of lending model can contribute to the achievement of competitive advantages. As argued by Alessandrini et al. (2011) the local branch of a large, nationwide bank competes and allocates resources differently with respect to the branches of a small and local bank. As result they can compete differently, in this way having a different monopoly market power. Despite the importance of the organizational structure and business model, the link between geographical distance and market power has been overlooked. In fact, the main contribution of the research into banks' geographical expansion relates mostly on the analysis of its impacts on cost efficiency or profitability, and productivity (recently Berger and De Young, 2001; Illueca et al., 2009). Recently Degryse and Ongena (2005) ascertained that the geographical distance between both commercial borrowers and their banks on bank loan rate can result in a different price discrimination strategy at different geographical distance's levels. Moving from these considerations, the present research aims to provide novel empirical evidence for the effect of functional distance between bank's headquarter and its subsidiaries on the market power. Moreover, the purpose of this paper is to provide proof on how and to what extent bank characteristics and environmental characteristics can affect a bank's market power. The focus is especially on the diversification strategies that can contribute to sustainable competitive advantages through the offering of different services and financial products. In our empirical analysis we use as a

control variable both bank characteristics and market characteristics. More in detail, we establish bank characteristics as ability to control the internal costs, the type of banks, the risk profile, capitalization, income and loan diversification, or we define them by the market structure, such as the market share, the presence of foreigner-owned subsidiaries and branches in the local market, Gross domestic product.

Working from the above considerations, this research potentially also has important regulatory implications, particularly in relation to competition policies. As argued by Wilson et al. (2010) the competition covers an important role in the banking market, since it has relevant consequences in terms of growth, efficiency, and welfare throughout the economy and market's stability.

In order to address this issues, we focus on the Italian banking market over the 2006-2009 period. The Italian market represents an interesting case for the study and application of the research on the determinants of market power, because the industry went through a decrease of productivity for the effect of the crisis without however being weakened by bankruptcy cases; and it is characterized by the presence of different types of financial institutions with peculiar organizational structures and lending models. Finally, the available dataset provides rich and detailed information on balance sheets for a large sample of Italian banks (almost 85% of the entire market).

In order to estimate the market power, we employ the Lerner Index (e.g. Shaffer, 1993; Angelini and Cetorelli 2003; Fernandez de Guevara et al., 2005; Casu and Girardone 2009, Turk Ariss, 2010) that measures the extent to which market power allows firms to fix a price above the marginal costs. As concerns the calculation of the cost management ability, we use a stochastic frontier model to measure the cost efficiency.

The paper is organized as follows: Section 2 provides a brief literature review; Section 3 describes the methodology and the data used, while Section 4 discusses the results. Finally Section 5 summarizes the conclusion.

2. Literature review

In the last few decades, the strategies implemented by banks in response to the changes in the competitive environment have varied. In the banking literature, a wide range of studies have examined the impact of these diversification strategies and business model on firm characteristics, such as potential growth, performance, and risk profile. The ongoing attention

of scholars for diversification can be traced in the tentative to identify how and to what extent a firm's success unfolds through diversification mechanisms. As a consequence, the continuous research activities on diversification contribute to the generation of an overlap of both empirical and theoretical contributions. In the banking literature, the debate on the effects of the geographical diversification is still controversial. At the increase of the hierarchically levels the incentive problems and agency costs (Berger and Udell, 2002; Stein, 2002; Takats, 2004), and the organizational frictions and bureaucratization in the lending policy seem to be higher (Berger et al., 2005). In opposition, another school of thought maintains that the proximity to potential borrowers is related to a higher and more detailed knowledge of worthy projects and the environment wherein borrowers operate (Alessandrini et al., 2011). The distance between bank's headquarters and its own branches, or between lenders and borrowers can produce different costs and benefits. In particular, a higher functional distance can be associated, for example, with less cost efficiency (Berger and De Young, 2006); higher economies of scale (Berger et al. 2010); higher adverse selection problem between bank and borrowers; and a higher cost of monitoring different cultural values inside the same group (Alessandrini et al., 2010). As concerns the contestability of the market, higher competition seems to have an impact on loan rates and the availability of bank credit to firms, while higher concentration implies lower loan rates and easier access to bank credit (Petersen and Rajan, 1995). On this point, both, the distance between commercial borrowers and banks, and the position of competitors with respect to borrowers affect the spatial price discrimination's banking strategy (Degryse and Ongena, 2005). Moreover, competition can matter for the determination of bank orientation in the case of relationship-based versus transactional lending. Specifically, as the competition increases, it is possible to observe a reduction of relationship lending (e.g. Boot and Thakor, 2000; Dell'Ariccia and Marquez, 2006). As concerns the business model, some studies analyzed the reversal relationship between diversification and market power, discovering that more competition leads to more bank specialization (Hauswald and Marquez, 2003). Recently, Berger and Udell, (2002) and Udell, (2009) highlighted that the loan policy is also strongly dependent on the business model. In any case, there is lack of empirical evidences on the inverse relationship between different business models and market power. We distinguish, therefore, the banks in accordance with their organizational structure type focusing on their cooperatives nature . In this way, we take in account how and to what extent various business models can affect the monopoly market power.

As concerns the firm's characteristics that can affect the relationship between functional distance and competition, diversification can play an important role. Diversification in fact allows for the transfer of unique non-imitable resources and capabilities to the new market, contributing to sustainable competitive advantages. Moreover, the bank offering a variety of services can attract a growing numbers of potential clients with different financial needs. From the market power viewpoint, the international geographical and industrial diversification strategies can also favour anti-competitive behaviour since companies can transfer profitability from one market to another in order to achieve tax or other advantages through, for example, reciprocal buying and mutual forbearance, in this way weakening their competitors (Berger and Ofek, 1995). Saloner (1987) argued that diversification allows a firm to adopt a price cutting strategy with the goal of either driving existing rivals out of the market or preventing potential rivals from gaining future entry. In this case the short-term losses should be overcome by profits from future higher prices. Again on this point, Tirole (1995) ascertained the existence of a higher market power due to the cross-subsidized predatory pricing. For our empirical research we measure of diversification in terms of both revenues and loans, which can contribute to explaining the existing differences in terms of market power. Diversification can provide competitive advantages in terms of performance, for example for small banks, as argued by Mercecia et al. (2007), through the expansion of their resources within their existing business lines where they possess distinctive comparative advantages. In any case, it is plausible to expect a decrease in the market power as the size of banks decreases (De Nicoló, 2000), as a direct effect of the minor market share.

Regarding the cost management's ability, a batch of literature has investigated the reciprocal effect of efficiency's measures and competition (Weill, 2005; Casu and Girardone; 2006). Schaeck et al. (2009) evaluated the relationship between efficiency, competition and soundness for a sample of European and U.S. banking industries and they found that the increases in market power predicts a relative increase in cost efficiency. As concerns the geographical diversification, Berger and De Young (2001) found mixed results in terms of optimal geographical scope for banking organizations since some can operate efficiently within a single region, while others may operate efficiently on a nationwide or international basic. Finally, we take in account the risk profiles that can affect both the performance and accounting costs of banks.

Focusing on the market characteristics, we take in account the presence in the local market of foreigner subsidiaries. The entry of foreign banks can furthermore alter the degree of competition in the banking market (Claessens et al. 1998; Bonin et al. 2005), which has a

decided effect on the existing financing obstacles. Giannetti and Ongena (2005) found that foreign bank entry has been associated with a more rapid growth of sales and total assets of large firms and with an increase in the industry's dynamics, in terms of both entry and exit rate, for large and medium firms. Moreover, we analyzed the effect on competition of the local market concentration given the local demand of loans. Moreover, we analyzed the effect of the local market concentration on competition given the local demand of loans. Finally, we control for some macroeconomic variables largely used in the efficiency literature (e.g. Brissimis et al., 2008), such as the Δ GDP.

3. Model specification

In this section we describe the empirical model that we put forward to investigate the relationship between functional distance, bank and market characteristics, and market power. Specifically, the model assumes the following form:

$$MP_{it} = f(FD_{it}, AD_{it}, ID_{it}, CE_{it}, RISK_{it}, MS_{it}, FO_{mt}, GDP_{mt}) + e_{it} \quad 1)$$

where $MP(it)$ is the monopoly market power; $FD(it)$ refers to the functional distance, $AD(it)$ is the index for the asset diversification; $ID(it)$ refers to the income diversification; $CE(it)$ is a measure of cost efficiency; $RISK(it)$ is the risk profile of the bank and it is calculated as the ratio of non-performing loans on total loans; $MS(it)$ is the regional market share of each bank weighted for the relative importance of the regional market, in terms of loans, population and number of firms, where the bank operates with its subsidiaries¹; $FO(mt)$ corresponds to the numbers of foreigner banks or their branches in the local market; $GDP(mt)$ refers to the gross domestic product to take note of business cycle effects and $e(it)$ is an error variable for each i bank firms. We include a dummy for the bank's business type and capitalization in the cost function. All the notions and descriptions of the variables are reported in Table 1.

 Insert Table 1 about here

¹ The relative importance of each local market is measured as the ratio of the total loans provided in a region on the total national loans.

3.1 Monopoly market power

In this research, we utilize the Lerner Index as a measure of monopoly power for each observation. Specifically, the Lerner Index measures the extent to which market power allows firms to set a price (P) above its marginal cost (MC). It is defined by²:

$$L = (P - MC) / P \quad (2)$$

where P is the market price fix by the firm and MC is its marginal cost. The index ranges from a high of 1 to a low of 0, with higher numbers implying greater market power where P is the price of output Y and it is calculated as the sum of revenues on total earning assets. In the main, revenues are calculated as the sum of interest income, commissions, financial income, and incremental changes in receivables on total earning asset, other incomes. MC is calculated from the translog cost function defined in equation 1) as follows:

$$MC = (\beta_m + \beta_{mmm} \ln Y_{it} + \sum_{j=1}^1 \beta_{jm} \ln W_{ijt}) (TC_{it} / Y_{it}) \quad (3)$$

For a perfectly competitive firm P is equal to MC and $L=0$. In this case a firm has no market power. We define a unique output in order to estimate the Lerner Index. The cost function is specified through the translog form that allows for the necessary flexibility when we estimate the frontier model. Specifically, our model assumes the following forms:

$$\begin{aligned} \ln(TC_{it}) = & \beta_0 + \sum_{j=1}^2 \beta_j \ln W_{ijt} + \sum_{m=1}^1 \beta_m \ln Y_{it} + \frac{1}{2} (\sum_{k=1}^2 \sum_{j=1}^2 \beta_{kj} \ln W_{ikt} \ln W_{ijt} + \beta_{mmm} \ln Y_{it}^2) + \\ & \sum_{j=1}^2 \sum_{m=1}^1 \beta_{jm} \ln Y_{it} \ln W_{ijt} + \sum_{i=1}^2 c_i Z_i + e_{it} \end{aligned} \quad (4)$$

where Y_{it} represents the “Total earning assets”, P_{1it} is the ratio of personnel expenses to number of employees, P_{2it} the ratio of the other administrative expenses to fixed assets, and P_{3it} the ratio of interest expenses to financial debts, TC_{it} refers to the total costs that include the sum of other administrative expenses, personnel expenses and interest expenses. Finally Z_{it} refers to a control variables. Specifically we choose as control variables: the level of bank

² The Lerner index is an indicator of monopoly market power and it presents some limitations: 1) it is influenced by the criteria chosen in the definition of revenue and costs; 2) it usually does not include the cost of risk, despite its relevance for bank costs and revenues; 3) in the case of a dynamic problem, the Lerner index cannot be an appropriate measurement of market power (Pindyck, 1985).

capitalization that can potentially explain differences in terms of costs, the business type to take in account the cooperatives nature of the banks, the years of economy recession. To impose linear homogeneity on the input prices, the variables were normalized in equation 3 with respect to P_{3it} in this way:

$$TC_{it} = \ln(TC_{it}/P_{3it}), W_{jit} = \log(P_{jit}/P_{3it}), j = 1, 2 \quad 5)$$

The symmetry restriction for coefficients is also imposed. The error term, ε_{it} , includes two main components: the first is the random error term (v_i), accounting for measurement errors, bad luck and other factors unspecified in the cost function, while the second one is the effect of inefficiency, u_i . The noise component is assumed to be a iid normal random variable with mean zero and constant variance σ_v . For this study we use Battese and Coelli's model (1992) where the efficiency terms is assumed to be independently distributed as a half normal zero. The cost efficiency estimates are obtained by calculating $CE_i = [\exp(-u_i)]^{-1}$. This measure takes on a value between 0 and 1. The cost efficiency estimates are obtained by calculating $CE_i = [\exp(-u_i)]^{-1}$. This measure takes on a value between 0 and 1 (or 100) where 1 stands for cost efficiency and any value lower than 1 denotes cost inefficiency. The parameter λ , that is calculated as the ratio between σ_u and σ_v , measures the amount of variation of inefficiency relative to noise for the whole sample. In according with Battese & Coelli (1992, 1995) the distribution of the inefficiency assumes the following form: $u_{it} = \eta_t u_i$ where $\eta_t = \exp[-\eta(t - T_i)]$ or $\eta_t = 1 + \eta_1(t - T_i) + \eta_2(t - T_i)^2$.

3.3 Market share

In order to evaluate strategic positioning on national territory, we employ a measure of market share. Following Coccoresse (2008), this measure is based on the calculation of the amount of a bank's branches in each local market. Specifically, we calculated beforehand the bank's market share based on its number of branches on the total number of branches for each region. Then we alternatively weighed that value for the relative importance of each region in terms of the amount of local loans produced. The formula used is the following:

$$MS_i = \sum_{i=1}^n \sum_{r=1}^R \frac{B_{ir}}{B_r} W_r^* \quad 6)$$

where B_{ir} is the number of branches of bank i in the region r on total branches $B(r)$ in the region r . We employ three different specification of weights, $W(r)$, to take in account the characteristics of the local market. Specifically these amount to: 1) the ratio of the amount of regional banking loans on the amount of banking loans provided at the national level; 2) the ratio of the amount of regional banking population as regards to the national population; 3) the ratio of the amount of the firms in the local market on the number of firms existing at the regional level.

3.4 Geographic distance

Previous studies have already calculated the distance between the bank's headquarter and the provincial capitals of the municipality the branches (Alessandrini et al., 2009; Degryse and Ongena, 2005). Here the geographic distance was determined as the distance between the zip code (ZIP) of the bank headquarters and the zip code (ZIP) of the municipalities in which the different branches were located (excluding the bank's number of branches). In our calculation of distance, we take in consideration the opening of each branch during the year over the period analyzed³. Following, we report the formula used for the calculation of geographic distance:

$$FD_i = \ln \left(\sum_{j=1}^n \sum_{i=1}^n \sum_{r=1}^R \frac{SB_{ijr}}{SB_r} (HQ_j - SB_{ir}) \right) \quad (7)$$

where FD_i is the functional distance, $HQ(j)$ is the headquarter for the bank j in region r , SB_{ir} are the subsidiaries i in the region r .

3.5 Diversification measures and risk measures

In this research, we consider two sources of diversification, namely: income and asset diversification. Specifically, we use two formula proposed by Leaven and Levine (2007). The formula for the assets diversification is the following:

$$1 - |(Net\ Loans - Other\ earning\ assets) / Total\ earning\ assets| \quad (8)$$

³ The distance of each subsidiary is considered by taking in account the number of months that a branch was actually operating during the year.

Other earning assets include securities and investments. The second measure determines the weight of interest income with respect to the commission income that produced by collateral and additional activities, as shown in the following equation:

$$1 - \frac{((\text{Interest Income} - \text{Commission income}) - \text{Total net margin})}{\text{Total net margin}} \quad (9)$$

Finally we include in the model a measures of risk taking that is calculated as the ratio of non-performing loans on total loans for each year.

3.6 Sample

The dataset consists of unbalanced panel composed of 2,567 observations. This data was provided by the Italian Banking Association. We exclude from the dataset the investment banks and the specialized banks (e.g. in leasing or factoring), foreigner banks. The coverage of our sample proportionately relates to nearly 80% of the population of the whole Italian banking system. As regards the geographical location of bank headquarters and branches and the amount of loans in each local market, the data was provided by the Bank of Italy. The macroeconomic data was taken from ISTAT. Table 2 reports the main descriptive data of the dataset. Table 3 shows the descriptive statistics for the inputs and outputs of the cost function.

Insert Table 2 about here

Insert Table 3 about here

4. Empirical Findings (preliminary results)

4.1 Marginal cost and Market Power in the Italian banking industry

The analysis of monopoly market power represents an important indicator in trying to understand the capabilities of a firm to set the price above marginal costs. In this way a higher market power reflects a lower market completion. Table 4 show respectively the average distribution of the marginal cost for all the years analyzed and the trend of the marginal cost from 2006 to 2009.

Insert Table 4 about here

The marginal cost is equal on average to .049 with a std. dev. equal to .022. As concerns the trend, the marginal cost increased from 2006 to 2008 - we believe- due to the effect of the crisis, while it decreased in 2009 in correspondence with the decline of the rate of national production.

Moving to the monopoly market power measures, the Lerner Index assumes an average value of .421 with a std. .125. It indicates that Italian banks compete amongst themselves in terms of price and fees applied to the client. As discussed by Coccorese (2008), despite the concentration of the market, there is no collusive behavior in the Italian banking market. These results are in line with those calculated by Fernandez de Guevara and Maudos (2005) for the whole banking sector in the European market.

The height of the monopoly market power has its peak in 2005 and then it seems to marginally decrease until 2009. In the same period, the increase of the marginal cost has affected the measures of monopoly market power, which seem to increase over the period 2007-2008. Nonetheless, the decrease can also be generated by a reduction of the revenues for the entire sector as a consequence of the recent crisis.

4.2 Panel Data model

In order to test equation 1, we use a panel data model with fixed effects⁴. Table 5 and Table 6 show respectively the correlation matrix and the results for equation 1.

⁴ The Hausman Test does not reject the Null as reported in Table 5.

Insert Table 5 about here

Insert Table 6 about here

Moving to the findings, we develop eight different model in order to check the robustness of the results. In detail, we discovered with all the observations for the model that cost efficiency and income size contribute to a significant increase of the monopoly market power, while geographical distance has a negative impact. Our findings show that the functional distance (which is calculated as the distance between the zip code (ZIP) of the bank headquarters and the zip code (ZIP) of the municipalities in which the different branches were located) is negatively related to the monopoly market power with a coefficient of $-.004^{***}$ on average. The major part of the observation refers to the banks with a cooperatives nature as shown in Table 1. In the case of banks with a cooperative nature, it is plausible that the functional distance appears to be not relevant for the monopoly market power. In fact, they are small banks that operate mainly in the local geographical areas. As argued by Battaglia et al. (2010) the performance of cooperative banks is strongly affected by the economic conditions of their local markets such as their concentration with respect to other banks. In line with these considerations and with Giannetti and Ongena (2005), the increase of the numbers of foreign-owned subsidiaries seems to contribute to a stimulation the market competition, as shown by the negative sign of the variable FO (it is calculated as the numbers of foreigners subsidiaries in the local market taking in account the weight of each local market in terms of banking loans). Instead, the presence of an increase of the geographical market's coverage (calculated in terms of numbers of branches) taking into account the local population and numbers of firms, appears to affect negatively the monopoly market power. It is, in fact, reasonable to expect an enhancement of competition level in the market where the demand of banking services, the population and the numbers of firms are likely to be high.

Focusing on the cost efficiency, it appears to represent an important goal for the increase of the monopoly market power. The dynamism of the competition in the local market can spur the national-owned banks to enhance their cost effectiveness. Concerning the diversification in terms of both loans and income, we found evidences that confirm the relevance of these strategies for the monopoly of market power in the period analyzed. Specifically, the

income diversification appears to increase the Lerner index. Thus, the diversification strategies can overcome the possible costs associated with them, such as the increase of risk and moral hazard behavior for example. This result is in line with other studies in the banking sector that see in specialization a way to increase the performance (Stiroh, 2004; Mercieca et al., 2007). As shown in the Model 3, the variable GDP changes significantly the sign when we control for the diversification and risk variables. This result suggests us that there is a potential link between the effect of diversification strategies and the GDP.

Focusing on the risk taking behavior, measured as the ratio of non-performing loans on total loans, it appear to be positively related to the monopoly market power, in this way embracing the competition-fragility theory (Allen and Gale, 2004). However the result is not significant in the specification of our models. Finally, the increase of the GDP seems to have a negative impact on the competition level. On this point, the recent financial crisis has highlighted the fragility of the bank system, especially in the US, where large banks were highly exposed to the default. Therefore the monopoly market power, which is also affected by size, can reflect the instability of the financial system.

5. Conclusions

This paper has provided empirical investigation on how and to what extent functional distance and other firm's variables, such as income and asset diversification, risk exposure, and cost efficiency, and market's characteristics can enhance the sustainable competitive viability of the Italian banks over the period 2006-2009. The monopoly market power and the cost efficiency were calculated using a cost translog function and the Battese and Coelli's model (1992) with a half-normal distribution for the inefficiency term. The monopoly market power is on average .421 over the period analyzed. It indicates that Italian banks compete amongst themselves in terms of price and fees applied to the client. As discussed by Coccorese (2008)⁵, despite the concentration of the market, there is no evidence of collusive behavior in the Italian banking market. In order to estimate the impact of firm characteristics on competition we employed a panel data model with fixed effects. The functional distance appears marginally and negatively associated with the monopoly market power, in this way suggesting that the presence in the local market and a relationship lending model can be potentially important for the monopoly market power. Focusing on

⁵ See also Mottura P., Munari L., (1990) "Italian Banks: Competition and Competitive Strategies", *International Journal of Bank Marketing*, Vol. 8 Iss: 3, pp.17 – 23.

other bank's characteristics, the cost efficiency and the diversification strategies result to be crucial for the enhancement of the bank's monopoly market power. Moving on, the market's variable suggests that the increase of the number of foreigner subsidiaries in the local market stimulates the market competition, as suggested by Giannetti and Ongena (2005). Finally, the increase of the GDP seems to favor the consolidation of the monopoly market power.

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Table 1.**Summary of Variables, notions, proxy and descriptions, Source**

VARIABLES	NOTION	PROXY	DESCRIPTION	SOURCE
Dependent variable	LE	Monopoly market power	Is measured with the Lerner Index.	ABI BANKING
FIRM-SPECIFIC	FD	Functional distance	The geographic distance is calculated as the distance between the zip code (ZIP) of the bank headquarters and the zip code (ZIP) of the municipalities in which the different branches were located (excluding the bank's number of branches). In our calculation of distance, we take in consideration the opening of each branch during the year over the period analyzed.	Bank of Italy
	CE	Ability to manage internal costs	Is measured with the SFA and specifically with the Battese and Coelli model (1992).	ABI
	RISK	Credit risk	Non-performing loans on total loans.	ABI
	AD	Asset Diversification	The Leaven and Levine Index (2007).	ABI
	IC	Income diversification	The Leaven and Levine Index (2007).	ABI
	ETA	Capitalization	The ratio of equity on total assets.	ABI
	TYPE	Business Model	This refers to three dummies connected to the type of banks: cooperatives nature of bank=1 , otherwise 0.	ABI
	MARKET-SPECIFIC	FO	Foreigner-owned banks and OR Foreigner-owned branches.	It refers to the numbers of foreign-owned banks or subsidiaries in a specific region.
MS		Market share	It is calculated as the bank's market share based on its number of branches on the total number of branches for each region. Then the value is weighted respectively for the relative importance of each region in terms of the amount of local loans produced, local population and number of regional firms (on their total value at national level).	ABI, Bank of Italy, Istat
GDP		Gross Domestic Product	The growth in GDP (annual %).	ISTAT

Table 2
Sample Description by Business Type

<i>Ownership</i>	<i>Observations over 2006-2009</i>		<i>Average size (*)</i>
	<i>Number</i>	<i>Percentage</i>	
“Popolari”	137	5.34 %	7,651,685
Cooperatives	1691	65.87 %	361,803
Other commercial banks	739	28.79%	10,384,741
TOTAL	2567	100%	18,486,502

Notes: (*) Values are in thousand euros. The average size is calculated in terms of total asset for each category.

Table 3
Descriptive Statistics of Total Costs, Input and Outputs

<i>Variables</i>	<i>Mean</i>	<i>Std Dev</i>	<i>Median</i>	<i>Min</i>	<i>Max</i>
TC(+)	160127.2	873,449.4	16,469.5	255	21,348,785
Y_1	12.579	1.778	12.579	7.762	19.60449
P(1)(++)	70.341	29.021	66.963	9.727	973.641
P(2)	1.654	5.335	0.686	.046	84.362
P(3)	.037	.019	0.033	.002	.293

Notes: Total number of observations:2567. (TC) = Total cost is calculated as the sum of other administrative expenses, personnel expenses and interest expenses; (Y_1)= “Total Earning assets”. (F_1) is the ratio of personnel expenses to number of employees; (F_2) is the ratio of the other administrative expenses to fixed assets; and (F_3) is the ratio of interest expenses to financial debts. (+) The value are expressed in thousands of euros. (++) It is expressed in thousand.

Table 4

Marginal Cost and Lerner Index over the period 2006-2009

	2006		2007		2008		2009	
	Mean	Std. Dev.						
Marginal Cost	0.047	0.084	0.052	0.024	0.054	0.020	0.041	0.015
Lerner Index	0.449	0.103	0.423	0.120	0.402	0.124	0.411	0.133

Notes: Marginal Cost and the Lerner Index are calculated from the translog cost function (Equation 2), in accordance with the formulas 4) and 5).

Table 5
Correlation Matrix

Variables	CE	FD	LD	IC	RISK	SIZE	ETA	GDP	MS(+)	MS(++)	MS(+++)
CE	1										
FD	-0.278*	1									
AD	-0.274*	-0.403*	1								
IC	-0.339*	0.381*	-0.219*	1							
RISK	0.069*	-0.229*	0.064*	-0.207*	1						
SIZE	-0.117*	0.775*	-0.444*	0.359*	-0.316*	1					
ETA	0.259*	-0.4400*	0.294*	-0.314*	0.148*	-0.481*	1				
GDP			0.080*	-0.098*	-0.143*	-0.055*	0.054*	1			
MS(+)	-0.241*	0.430*	-0.360*	0.399*	-0.207*	0.766*	-0.385*	0.055*	1		
MS(++)	-0.196*	0.465*	-0.267*	0.113*	-0.190*	0.542*	-0.235*	0.437*	0.681*	1	
MS(+++)	-0.335*	0.454*	-0.187*	0.158*	-0.208*	0.477*	-0.280*	0.432*	0.589*	0.836*	1

Note: FD is the functional geographic distance that it is determined as the distance between the zip code (ZIP) of the bank headquarters and the zip code (ZIP) of the municipalities in which the different branches were located; CE refers to cost efficiency calculated with the SFA model; AD and IC are respectively the asset diversification and income diversification (Laeven and Levine, 2007); RISK refers to the ratio of not performing loans on total loans; MS is the bank's market share based on its number of branches weighted for the total number of firms in each region on total firms at national level (++ weighted on regional population, +++weighted on regional firms); SIZE is the logarithm of total assets, and ETA is the ratio of equity on total assets, GDP is the Δ Gross Domestic Product.

P value <.01

Table 6

The effect of market and firm's variables on the monopoly market power

	1	2	3	4	5	6	7	8
CE(t)	1.525*** [4.26]	1.519*** [4.24]	1.455*** [4.08]	1.385*** [3.92]	1.504*** [4.21]	1.525*** [4.26]	1.525*** [4.26]	1.419*** [3.95]
FD(t)	-0.00360* [-1.68]		-0.00207 [-0.96]	-0.00232 [-1.11]	-0.00358* [-1.67]	-0.00400* [-1.85]	-0.00360* [-1.68]	-0.00594*** [-2.83]
AD(t)	0.0216 [1.63]	0.0222* [1.68]		0.0181 [1.37]	0.0203 [1.54]	0.0216 [1.63]	0.0216 [1.63]	0.0318** [2.41]
IC(t)	0.137*** [6.92]	0.133*** [6.77]		0.112*** [6.70]	0.135*** [6.86]	0.137*** [6.92]	0.137*** [6.92]	0.179*** [10.07]
RISK(t)	0.00433 [0.88]	0.00421 [0.85]		0.00307 [0.62]		0.00438 [0.89]	0.00433 [0.88]	0.00695 [1.41]
MS(+)	-0.00573* [-1.82]	-0.00654** [-2.10]	-0.00574* [-1.80]	-0.00582* [-1.85]	-0.00575* [-1.83]		-0.00573* [-1.82]	-0.00547* [-1.73]
GDP	0.203** [2.36]	0.166** [2.00]	-0.127* [-1.74]		0.195** [2.28]	0.206** [2.40]	0.203** [2.36]	0.553*** [12.81]
FO	-0.00139*** [-4.69]	-0.00151*** [-5.22]	-0.00237*** [-8.93]	-0.00200*** [-13.49]	-0.00142*** [-4.82]	-0.00138*** [-4.65]	-0.00139*** [-4.69]	
MS(++)						-0.00204 [-0.50]		
_CONS	-0.731** [-2.48]	-0.732** [-2.48]	-0.543* [-1.86]	-0.557* [-1.95]	-0.710** [-2.41]	-0.730** [-2.47]	-0.731** [-2.48]	-0.777*** [-2.62]
Rsquared	.117	.112	.094	.114	.119	.100	.117	.101
Hausman	110.26***	102.61***	59.60***	105.08***	124.04***	76.44***	110.26***	57.09***
N	2567	2567	2567	2567	2567	2567	2567	2567

Note: The dependent variable is Lerner index calculated from the translog cost function. FD is the functional geographic distance that it is determined as the distance between the zip code (ZIP) of the bank headquarters and the zip code (ZIP) of the municipalities in which the different branches were located; CE refers to cost efficiency calculated with the SFA model; AD and IC are respectively to asset diversification and income diversification (Laeven and Levine, 2007); RISK refers to the ratio of not performing loans on total loans; MS is the bank's market share based on its number of branches weighted for the total number of firms in each region on total firms at national level (++ weighted on local population); FO refers to the numbers of foreigner-owned branches in the local market weighted for the relevance of regional loans, GDP is the Δ Gross Domestic Product.

P value <.01 ***, .05 **, .10 *

