THE EFFECTIVINESS OF A NETWORK SYSTEM IN IMPROVING THE FINANCIAL INNOVATION OF THE COOPERATIVE BANKS(*)

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ABSTRACT

The paper intends to highlight how the network theory can allow the cooperative banks to become more effective in improvong financial innovation in order to sustain the Italian small-medium enterprises (SMEs). In this context, the work investigates different clusters of Italian cooperative banks for verifying if and to which extent they promote or guarantee a strong relationship with customers with particular reference to innovative financial services.

Taking into account the cultural, managerial and organizational requirements of local banks, the research intends to verify if a structure – such as the cooperative banks' network – is able to enhance the degree of financial and strategic services such as private equity.

JEL CLASSIFICATION: G21; G24

PAROLE CHIAVE: Network theory; cooperative banks; relationship banking, financial innovation; private equity.

(*) Although the paper is the combined work of two authors, the first, second and fifth paragraphs were written by Michele Modina, while the third and fourth paragraphs refer to Massimo Arnone.

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1. INTRODUCTION

The paper analyzes the opportunities and challenges for local banks, such as cooperative banks, to take the dynamics of the economic context into account in the light of the financial crisis. In particular, the work highlights the main cultural and organizational difficulties that prevent local banks from offering the highest value financial services, such as private equity.

Compared with other categories of banking intermediary, local banks can mitigate the effects of asymmetric information in two main ways: a) by leveraging greater territorial vocation that allows them to have a greater control of the territory and customers; b) by supporting network system that could allow the cooperative banks to improve innovation and competitiveness without alter their mutual identity of local banks. However, these advantages are offset by the lower propensity of local banks to offer non-traditional services such as merchant banking services. The search for solutions that allow local banks to expand their supply without distorting their essence is the goal of this work that is structured as stated below.

The following paragraph describes the role of local banks and how network approach could be crucial for reinforcing their competitive advantage. The third paragraph illustrates a comparative analysis between a sample of cooperative banks (the ones that operate in the more Italian advanced regions - Lombardy, Piedmont, Veneto, Emilia-Romagna) and the other Italian cooperative banks. The fourth paragraph is devoted to the empirical analysis and aims to identify how the services of merchant banking and, in particular, private equity transactions contribute to the profitability of cooperative banks. Based on the results of the analysis, the fifth paragraph ends with some concluding remarks regarding the strategies that local banks can adopt to strengthen the role of higher value financial services.

2. LOCAL BANKS AND NETWORK THEORY

Local banks have played an important role in the development of Italian industrial system. As pointed out by Fortis (2008), the direct knowledge of the entrepreneur and of his personal and professional history, the proximity of decision centers and the reflections of a set of social interactions have made it possible to reduce the opacity of information that characterizes the relationship between borrower and lender.

In this context, the local bank acquires a competitive advantage over larger credit intermediaries and other financial intermediaries (venture capital and private equity operators). The intense relationship between the bank and the operating area allows the bank to collect soft information which is instrumental in strengthening the credit process thanks to peer monitoring (Stiglitz, 1990). While not codified, the soft information fits easily into the creditworthiness process due to the physical proximity between the bank's decision-making center and the point of information collection (Stein, 2002; Berger et al., 2005). The absence of pyramidal structures, typical of the largest banks, and the less stringent operational processes enable the local bank to be more effective in serving the needs of the firms.

Since the nineteen nineties Italy has been affected by a profound consolidation process that has contributed towards reshaping the scope of banking and changing the relationship between banks and firms (Bonaccorsi di Patti and Gobbi, 2001, Sapienza, 2002). In this context, two elements are of particular importance: the evolution of the organization and distribution of the bank and the introduction of internal rating systems. The transition from the general to the divisional model and the subsequent return to service models that re-evaluate the role of the relationship manager (i.e. branch manager) has weakened the value of asset information accumulated over time even in local banks. Similarly, the rating is still

similar now to a black box with unclear boundaries and content unsuitable for building a long-term relationship (Modina, 2012).

The crisis is another important element that redesigns the intensity and duration of the relationship between business, bank and territory. The crisis generates structural fractures that affect the competitive dynamics and make the conditions for accessing the credit market more stringent. The deterioration in the quality of the loan, the pressure on bank capital and the weak economic conditions of the borrower produce a negative impact both on the demand and on the supply side.

In this scenario of uncertainty, the banking sector has reacted in different ways. The big financial institutions have moved into the direction of external growth both on national and international scale, while local banks have tried to find the best strategic and tactic option to maintain their competitive advantage. One option followed by smaller banks is the creation of networks in order to enhance their efficiency and their economic and market performance. In this perspective, every member of the network acts as a single knot of a disseminated network of local banks, which share products, services and best practices in the organizational process. Allen and Babus (2008) argue that a network approach to financial systems is particularly important for assessing financial stability and can be instrumental in capturing the externalities that the risk associated with a single institution may create for the entire system.

Local banks can realize important benefits by forming networks. Forming networks allows the pursuit of economies of scale and scope, as well as the provision of a safety net or mutual support mechanism that can compensate for the risk concentration an individual bank with a homogenous member base faces. Desrochers and Fischer (2005) find that: i) integration tends to reduce volatility of efficiency and performance regardless of its level of development; (ii) integration appears to help control measures of managers' expense preferences; (iii) despite the high costs of running hub-like organizations, network systems operate at lower costs than less integrated systems.

The networks between local banks can be organized as relatively flat organizations or as multi-levelled structures including in between levels of regional groups or associations (Fonteyne, 2005). Modina and Polese (2008) identify that a suitable structure for local banks could be a polycentric network characterized by the presence of as many centres as the number of member banks. Based on some fundamental variables (knot characteristic, knot trait comparison, localization, centrality degree), in the polycentric structure every local bank acts as an equal partner in activities like the government designation, the evolution processes participation and the resources release. In this system, all the nodes (banks) have the same dimension and keep the mutual relationship with the main territorial actors. In this framework, the local banks could maintain their comparative advantage respect to larger banks, strengthen their economic performance and become a vehicle of innovation.

Given the importance of network in explaining the success of local banks, the next section of the paper conduct an empirical analysis in order to verify how much the financial services falling within the business area of private equity transactions are common in the cooperative banks and especially in those banks that operate in more advanced regions (Lombardy, Piedmont, Veneto, Emilia-Romagna). By examining the results, the paper explores how local financial institutions, which join a network, could face fundamental challenges and evolve their competitive advantage.

3. THE ECONOMIC PROFILES OF COOPERATIVE ITALIAN BANKS IN LIGHT OF INTERNATIONAL CRISIS: A COMPARATIVE ANALYSIS BETWEEN THE BANKS IN REGIONS OF TECHNOLOGY DISTRICTS AND THE NETWORK OF COOPERATIVE CREDIT

This paragraph describes the intensity of the effects of the crisis on management profiles of the Italian cooperative banks. The analysis focuses on the performance of the 404 cooperative banks with reference to the profiles of structure, profitability, efficiency and risk. The data sheet and income statement for the period 2006-2011 are analyzed not as absolute values, but as rates of change compared to 2006 (Table 1).

rates of change (2011-2006)	BCC in the regions of technological districts (Lombardia, Emilia Romagna, Piemonte, Veneto)	Cooperative Credit System (Other Cooperative Banks)
Funding	43%	38%
Loans to customers	40%	43%
Financial assets	28%	36%
Equity	23%	29%
Profit	-90%	-56%

Table 1: The balance sheet and statement of BCC Italian in the period 2006-2001

The analysis of the different profiles is done through a system of financial ratios distributed as follows for each profile:[3]
- five about the ratio loans to deposits and the credit risk;
- three for profitability;
- one (cost-to-income ratio) for operational efficiency.

Structural profile and risk

The indicators relating to ratio loans to deposits and to and credit risk allow the expression of the considerations about the capacity of the cooperative banks to hedge the credit risk in times of economic turbulence. The dynamics of these indicators is interpreted from the perspective of the development processes of the assets; this is a necessary condition for each bank to protect the savings of depositors, ensuring at the same time, the financial needs of all stakeholders.

The first indicator placed under observation (equity on total assets) provides a measurement of the degree of capitalization of the BCC. This quotient identifies the coverage provided by the owned capital to total investments. On average, the BCC of the four surveyed regions have financed 10% of their assets using the means showing their values do not differ much between the pre-crisis period (2006) and the first years of the financial crisis (i.e. until 2009) and then see increase significantly in absolute terms the difference in the last two years (2010 and 2011).

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[3] For a more detailed description of the approach to analyze the performance of any banking intermediary through financial ratios, please refer to Bisoni (2012), Rutigliano (2012, 2011), Tutino (2005), Lucianetti (2008), and other Biasin (2013).

In particular, in 2010 these banks have increased the use of financial sources of the property to satisfy their operational decisions, while in 2011 they reduce again their capital ratios (Table 2). The rest of the BCC has, however, shown a steady decline in the degree of capitalization (Table 3).

The ratio funding/total liabilities expresses the incidence of bank deposits and debt securities on total assets. This ratio provides a measure of the level of interest-bearing debt backed by the credit cooperative system. From the available data showed that after growth in the early years of the crisis, the BCC have significantly reduced the use of financial sources not owned by them to finance their assets. The BCC of the four regions investigated as well as those of other Italian regions showed an average debt levels ranging from 76% to 80% (Table 2). The growth in direct deposits is stable even if there is a decrease from 2011 (Table 3).

The third indicator - loans to customers/funding – refers to the brokerage operation exchanged with customers. This ratio provides a measure of the propensity of banks to engage in lending activity. With reference to the sub-sample of the BCC the intensity of this relationship has been stable in the early years of the crisis and to reach a significant reduction. The other Italian BCC show a lower propensity to loans (the average value of loans / deposits ratio is 86% against 93% of the sub-sample), but showed a minor contraction during the observed period (Table 3).

The fourth indicator - tangible assets / total assets - shows how much of the activity is used in a sustainable way in the management of the bank. From the data available it was found that the global crisis had no significant impact on the dynamics of the fixed assets (tangible and intangible). However, the "assets / total liabilities", which measures the impact of funding sources owned by the company, shows a sinusoidal for both examined peer-group.

With reference to the profile of risk, the indicator used to capture the dynamics of credit risk in the cooperative credit system is the ratio of total adjustments funding/gross loans to clients. These adjustments experience, on the whole, a modest effect which is the reflection of the positions of the informational advantage of the cooperative banks. However, the sub-sample of the BCC shows a more virtuous behavior of the indicator with the co-operative banks in other Italian regions (Table 3).

COOPERATIVE BANKS IN FOUR INVESTIGATED REGIONS					
Rates of change	**2007**	**2008**	**2009**	**2010**	**2011**
Equity / Total assets	-5%	-4%	-2%	27%	-11%
Funding/Totale liabilities	-2%	6%	10%	4%	3%
Loans to customers/Funding	1%	-40%	-7%	-4%	-2%
Tangible assets / Total assets	-39%	-37%	-36%	-28%	-37%
Total adjustments funding/gross loans	-34%	-24%	-10%	5%	34%

Table 1: Structural indicators - based on data Federcasse

COOPERATIVE BANKS OF OTHER ITALIAN REGIONS					
Rates of change	**2007**	**2008**	**2009**	**2010**	**2011**
Equity / Total assets	0%	-34%	-1%	-3%	-6%
Direct Funding/Totale liabilities	2%	5%	7%	7%	1%
Loans to customers/Funding	1%	-2%	-5%	-1%	4%
Tangible assets / Total assets	2%	-5%	-8%	-8%	-10%
Total adjustments funding/gross loans	-7%	3%	44%	24%	37%

Table 3: Structural indicators - based on data Federcasse

Earnings profile

The considered profitability ratios are: interest margin on margin of brokerage; return on Equity (Roe); the profitability of brokerage (net profit/margin of brokerage).

The first indicator provides information on the degree of disintermediation of the bank. Lower values of this quotient denote the largest bank's ability to generate revenue outside of traditional lending activities. The contribution of the services has gradually declined over the period examined for both groups of banks (Table 5 and Table 6). This trend, however, depends mostly from the lower contribution of money management rather than the increase in the contribution of services.

The ratio "Net profit/equity" better known as ROE (Return on equity) measure the profitability of the total net assets of the bank. The BCC of the four regions investigated have on average a profitability of 26% slightly lower than that of the other sub-sample which is equal to 28%. However, starting in 2008, this indicator shows a decreasing trend which is accentuated in the last year examined especially for BCC operating in the most industrialized regions.

The last indicator of profitability calculated – net profit/margin of brokerage – confirms that since 2008 the earnings capacity of cooperative banks has gradually diminished. The crisis has caused a significant decline in profitability from asset management and making banks more vulnerable object of study compared to its competitors bank of greater size and orientation with a multi-business, multi-product and multi-client (Table 4 and Table 5).

COOPERATIVE BANKS IN FOUR INVESTIGATED REGIONS					
Rates of change	2007	2008	2009	2010	2011
Interest margin on margin of brokerage	3%	5%	-8%	-9%	-7%
Return on equity (ROE)	1%	-7%	-24%	-48%	-28%
Net profit/ Margin of brokerage	8%	-23%	-57%	-77%	-91%

Table 4: Profitability ratios - Based on data Federcasse

COOPERATIVE BANKS OF OTHER ITALIAN REGIONS					
Rates of change	2007	2008	2009	2010	2011
Interest margin on margin of brokerage	3%	4%	-9%	-7%	-4%
Return on equity (ROE)	3%	-3%	-15%	-22%	-3%
Net profit/ Margin of brokerage	2%	-27%	-61%	-78%	-64%

Table 5: Profitability ratios - Based on data Federcasse

Profile of efficiency

Following the contraction in margins, achieving adequate levels of efficiency is an objective of primary importance for banks and, in particular, for small ones that compared to larger ones, suffer less diversification of revenues.

The examination of the profile in question focuses on the cost-income ratio - the ratio between operating expenses and margin of brokerage - which compares the cost of structure of the bank with the result of money and services management.

Based on the data available, it should be noted that since 2007 the indicator in question shows, for both samples of banks, a progressive worsening confirming the difficulty of smaller banks to keep in line their operational efficiency.

COOPERATIVE BANKS IN FOUR INVESTIGATED REGIONS					
Rates of change	**2007**	**2008**	**2009**	**2010**	**2011**
Cost to income ratio	-59%	-56%	-61%	-67%	-72%

Table 6: Efficiency Indicators - Based on data Federcasse

COOPERATIVE BANKS OF OTHER ITALIAN REGIONS					
Rates of change	**2007**	**2008**	**2009**	**2010**	**2011**
Cost to income ratio	-63%	-60%	-64%	-70%	-75%

Table 7: Efficiency Indicators - Based on data Federcasse

4. LOCAL BANKS AND INNOVATIVE FINANCE: AN EMPIRICAL ANALYSIS

The empirical analysis aims to assess the role that local banks play in supporting financial services such as private equity ones. The local banks surveyed are those operating in areas where private equity transactions are better developed. Therefore, the regions under investigation are Piedmont, Veneto, Lombardy and Emilia-Romagna where there are technological districts dealing in wireless technologies, nanotechnology, biotechnology and advanced mechanics.

The region with the largest number of investments is Lombardy with 177 investments (37% of the total transactions carried out in the five-year period - Table 8 in the Appendix). The sample of banks is made up of 71 banks (30 in Lombardy, 22 in Veneto, 12 in Emilia - Romagna, 7 in Piedmont) and was defined using the registered office of each local bank and the number of branches. The Tables 12,3,14,15 (see Appendix) show that the sample constructed in this way may be considered sufficiently representative of the local structure of the banking system in the four regions. The dataset used consists of a total of 355 observations; Lombardy contains the largest number of cooperative banks and popular banks (Table 9).

Region	*Absolute Frequency*	*Relative Frequency*	*Cumulative Frequency*
Emilia-Romagna	60	16,90	16,90
Lombardy	150	42,25	59,15
Piedmont	35	9,86	69,01
Veneto	110	30,99	100,00
Total	355	100,00	

Table 9: Sample structure

The financial sector investigated was merchant banking in that it contains private equity transactions. In order to monitor the level of diffusion of private equity activity within local banks, a panel model has been preferred rather than an alternative approach (such as linear regression) because it allows different observation units to be monitored (i.e. 71 different local banks) at different moments of time. The panel model has fixed effects since the main objective is not to determine whether there are significant differences in the approach to advanced financial services among individual banks, but if there are any differences between the regions examined. Since there are no proxies to monitor the specific skills in merchant banking, the quality of the bank management is treated as individual, constant and unknown effects (a_i).

These individual effects are the intercept of a panel model with fixed effects and vary from one observation to another:

$$y_{it} = a_i + x'_{it}\beta + \varepsilon_{it}$$

With reference to this empirical analysis, the effects vary for each of the 71 banks forming part of the sample and include information that cannot be observed and that identifies each of these banks uniquely. Therefore, these individual effects cannot be considered as random variables, that is the result of a random extraction from some underlying population.

The lack of information on these intangible assets of the supply model of local banks is solved by using a fixed effect estimator (or within estimator). Through this preliminary transformation of the variables (both the dependent and explanatory variables), the individual effects a_i are eliminated:

$$y_{it} - \overline{y}_i = \left(x_{it} - \overline{x}_i\right)'\beta + \left(\varepsilon_{it} - \overline{\varepsilon}_i\right)$$

The OLS estimator obtained on each of the coefficients of the model is often called the transformed panel within the estimator or fixed effects estimator and formally assumes the following expression:

$$\beta FE = \left[\sum_{i=1}^{N}\sum_{t=1}^{T}\left(x_{it} - \overline{x}_i\right)\left(x_{it} - \overline{x}_i\right)'\right]^{-1}\sum_{i=1}^{N}\sum_{t=1}^{T}\left(x_{it} - \overline{x}_i\right)\left(y_{it} - \overline{y}_i\right)$$

Basically, it was decided to estimate a panel model with fixed effects, rather than a random effects panel model, because this empirical analysis does not explain the differences between each bank and because the average individual bank x differs from the average individual bank j. The attention is thus focused on the differences within each local bank as y_{it} differs from $\overline{y}_i$.

The model aims to evaluate the relationship between a dependent variable indicative of the profitability of local banks and the independent variables, established through the breakdown of the economic "net revenues from services" using the information contained in the bank's balance sheet and in the notes. As proposed by Capizzi (2007), the economic aggregate "net revenues" is broken down into a series of subheadings that can bring the range of products and services offered to customers (investment services, financial advisory services, merchant services, banking services, securities trading for own account). Using this distribution of net revenues, it is possible to check whether a financial shock boosts or cuts the effects of investment banking services on banks' profitability. The analysis focuses on merchant banking because within this sector it is possible to trace the operations of venture capital and private equity.

Model variables

All explanatory variables in the model are expressed as a percentage of net revenues from services. The dependent variable, expressing bank profitability, is constructed as the ratio of net interest income and operating income. It assesses the ability of the bank to offset the lower contribution from money management with the largest contribution from the services. The reciprocity of this indicator summarizes the contribution of management services to profitability. With a constant interest margin, higher values of the quotient denote a lower capacity of the intermediary bank to generate gross profitability. From this comments can be made on the degree of innovation of the banks under investigation.

The following table shows the explanatory variables of the estimated panel model, their formalization and analytical information being extracted from the notes used in their construction.

Type of Operation Merchant Banking	Proxy variable	Analytical expression (% Revenues from Services)	Sections of the Notes
Operation Funding	TDRS	Debt/Revenues from services	Item 80 - Section 4
Acquisition of investments	TCRS	Equities/Revenues from services	Item 80 - Section 4
Financial covenants	CFRS	Comm. guarantees/Revenues from serv.	Other Information
Dividends	DFRS	Dividends / Revenues from services	Item 70 - Section 3

Table 10: Explanatory Variables of the Model Panel

The first variable (TDRS) provides information on the contribution to revenues from services in the bond buying business. In particular, the dynamics of this variable may provide some indications on the spread of financing operations, which represent a mode of expression of *merchant banking*[4]. The second variable (TCRS) provides information on the average percentage incidence of financial assets available for sale relating to equity securities; in this context it is possible to depict the contribution of the merchant banking business through the acquisition of shares in the share capital of target companies. The third variable (CFRS) provides information on the average percentage incidence of commissions generated from cash loans on net revenues by services and in particular on the local banks' use of financial *covenants* i.e. clauses that guarantee the right of share redemption in the event of failure to achieve the set economic-financial parameters. The last variable (DRS) provides a measure of the average percentage of financial assets and, in particular, the dividends arising from investments in associated companies.

These explanatory variables were combined with regional dummies (royal), which were crossed with each of the explanatory variables (and which identify whether local banks operate primarily in one of four regions under examination).

The panel model is designed in this way:

$$\text{Profitability} = \sum_{i=1}^{4} \beta_i * \mathrm{Re}\,gio + \varepsilon_{it}$$

In a more extended form:

$$
\begin{aligned}
\text{Profitability} =\ & \beta_{1i} + \\
& + \beta_1 \sum_{i=1}^{77} \sum_{2006}^{2010} TDRS_{it} * \mathrm{Re}\,gio + \\
& + \beta_2 \sum_{i=1}^{77} \sum_{2006}^{2010} TCRS_{it} * \mathrm{Re}\,gio + \\
& + \beta_3 \sum_{i=1}^{77} \sum_{2006}^{2010} CFRS_{it} * Regio + \beta_4 \sum_{i=1}^{77} \sum_{2006}^{2010} DRS_{it} * \mathrm{Re}\,gio + e_{it}
\end{aligned}
$$

Results

The dataset consists of 1,155 observations having monitored 5 variables for each of the four years in question (2006-2010) and for each of the 77 sampled banks. The relationship

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[4] See Caselli (2009), Forestieri (2011).

between each explanatory variable and each dependent variable is observed through economic and statistical interpretation.

With reference to the first variable (TDRS), adopting a probabilistic reasoning (i.e. using the p-value criterion) inhomogeneities emerge within the sample; in fact, with the exception of the banks in Emilia Romagna and Lombardy, none of the other banks have relied on sales of debt securities to raise their levels of economic performance. At a confidence level α amounting to 5%, the coefficients estimated for this first explanatory variable differ significantly from zero only for local banks operating in Emilia Romagna and Lombardy (Table 11 in the Appendix). Observing the standard error which expresses a measurement of the internal variability of local bank samples subdivided per region, they are lower for the banks in Emilia Romagna and Lombardy, thus leading to higher statistical t-Student values (respectively equal to -2,16 and -3,89) than the critical value (equal to 1,984) (i.e. these statistics fall within the region of the null hypothesis rejection). Therefore, financial assets available for sale in the form of financing transactions in the merchant banking sector have exerted a significant contribution on the economic performance of banks located in these two regions.

With regard to the second variable (TCRS), the results indicate that the banks in Lombardy and Piedmont seem to pay more attention to the profitability of management services (i.e. the components of gross income) rather than the profitability of money management (i.e. the components of net interest income). In particular, these banks have a significant average value of the "equity/net revenues from services" ratio in the four-year period observed. The p-value associated with the beta coefficients are estimated to be less than the confidence level α (5%), thus prompting the rejection of the null hypothesis (Table 11 in Appendix).

With regard to the third set of variables (CFRS), local banks in all regions have values close to zero. All p values associated with the estimated coefficients for each of the explanatory variables of the model are lower than the confidence level of 5% ά suggesting the importance of these variables on the profitability of local banks in all four regions. Standard errors are less than half of the relevant estimated coefficients thus determining t-Student with higher values and, therefore, within the rejection region of the null hypothesis. Local banks show a preference for receiving collateral for lending rather than resort to other mechanisms for the protection of investments such as the ability to play an active part in the appointment of the management, the right to appoint one or more members on the Board of Administration of the company and even the conclusion of contractual clauses that do not qualify as financial covenants[5] (Table 11 in Appendix).

With reference to the last variable (DRS), the empirical results show that, with the exception of the banks in Lombardy, the contribution of financial assets and investments in the form of coupon and dividend income is residual. With a p-value of 5%, the estimated coefficients for the explanatory variable in the other three regions differ significantly in fact from zero. The associated standard error is greater than half the value of the estimated coefficients leading to low values of t-Student (Table 11 in Appendix).

The results allow some considerations to be expressed regarding the critical supply of innovative financial services by local banks.

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[5] These results for this explanatory variable confirm the findings of Baravelli et al. (2002) which was reached in an earlier contribution, with particular reference to the operations of the Sicilian banks only for the period 1993-1998. This author argued that the increase in non-performing loans in this period demonstrated that local Sicilian banks had accepted a high credit risk and this is why their customers demanded more collateral or they had committed errors in the evaluation of credit risk, with the result that, by failing to have adequate safeguards, they were facing heavy losses.

Despite the fact that in the four regions observed there are significant technological districts (advanced mechanics in Emilia Romagna, biotechnology in Lombardy, nanotechnology in Veneto, ICT in Piedmont), local banks offer a modest presence of services with higher value services such as private equity, which could contribute towards increasing the firm's capitalization and strengthen the ability to do research.

The results of the empirical analysis highlight the need to redesign the relationship between bank and enterprise and to rethink the system of relationships even when bank intermediaries assume the role of local banks. Science-based companies, which operate in sectors with high innovation potential, need advanced lending services and financial tools in order to assist them in the various stages of the research and innovation life cycle. The bank must expand the traditional credit support available to such firms, with functional financial services to facilitate the transfer of research results into profitable businesses.

The smaller size and traditional lending orientation prevent local banks from offering more sophisticated financial instruments. The size makes it more difficult to achieve sufficient levels of operational and allocative efficiency, while the traditional lending offer leads toward a specialization in customer segments with more limited financial needs. Local banks are thus faced with the choice of either diversifying or maintaining their vantage points relative to the territorial milieu. It is time to think about new forms of organization that can also allow local banks to explore new business areas (such as private equity) in order to maintain their competitive position in districts undergoing profound transformation.

5. CONCLUSION

The crisis that began in 2007 has produced important effects on the real and financial economy and on the relationship between banks and companies. The greater pressures from competition have made small and medium-sized Italian companies much more fragile on international markets, especially in the manufacturing sectors. In this macroeconomic environment, activities such as scientific research, the transfer of new technologies and knowledge and technological and organizational innovations emerge as the main key factors in order to boost the competitiveness of Italian firms. The more complex financial needs of firms require local banks to expand their offer proposition in order to include innovative services, such as those related to venture capital and private equity.

The empirical analysis carried out in this paper has highlighted that local banks play a minor role in the private equity segment. Local banks must re-think their business model in order to maintain their key role in supporting Italian districts (including the more tech-oriented ones). Each bank faces significant challenges that require a redefinition of its competitive position. This approach is particularly important for value-added services such as the private equity one.

Any bank wishing to enter the private equity business must be able to design a productive process that can be broken down into eight different stages, each of which requires activities, resources, knowledge and well-defined professional profiles. In the early stages (scouting and starting relations with target companies), it is useful to exploit the benefits deriving from relationships with external professionals and advisors. In the later stages (negotiation and closing), it is important to avoid potential opportunistic behavior in order to allocate voting rights efficiently in the shareholding structure.

In carrying out these activities, local banks can leverage the informational advantages associated with being a traditional lender (Baravelli 2001, 2003) and the presence of a capillary and less bureaucratic structure (Anolli et al., 2008). On the contrary, they suffer some major weaknesses: a modest ability to negotiate with the target company (lack of senior

staff), the lack of knowledge on risk management and evaluation issues especially in the most innovative sectors and a poor track record.

To explore the private equity market successfully, leveraging on the advantage of being a territory-oriented bank, local banks must promote the co-investment logic and develop a widespread network approach.

The co-investment logic would lead to a significant increase in the ability to intervene in support of innovative firms where the default risk is higher. In this regard, the creation of a joint national-local fund could be useful. This mechanism, known as an up slide leverage scheme, allows small local banks to co-invest in a national fund; in case of loss, they bear a pre-defined portion of the losses, but they benefit asymmetrically from the return.

With reference to the reinforcement of the network approach, the solid presence in the territory of local banks can foster the private equity activity. Territorial knowledge can contribute significantly to enhance origination activities, while the decentralization of the private equity process (screening, evaluation, due diligence) in a logic of co-responsibility among private equity funds and local banks helps to lower operating costs and to create awareness towards small and innovative companies.

Considering the importance of this topic, further research is required into how the local banks could foster their presence in the private equity market. Future research should include in the model panel: a) explanatory variables on the characteristics of regional firms such as age, size, turnover, number of employees, sector specialization; b) a proxy of the intensity of the bank-firm relationship obtained by administering a structured questionnaire to local banks (supply side) and firms operating in science-based sectors (demand side). Some limitations of this study should also be underlined. First of all, the results may have been influenced by the setting in which the research was carried out (four Italian regions). Therefore, attention should be paid when the results are generalized to contexts characterized by a different degree of diversification in the banking supply model.

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APPENDIX

Regions	2006	2007	2008	2009	2010
Abruzzo	0%	0%	1%	0%	0%
Basilicata	0%	0%	0%	0%	0%
Campania	4%	2%	1%	4%	4%
Emilia Romagna	17%	15%	12%	10%	10%
Friuli Venezia Giulia	4%	1%	3%	0%	3%
Lazio	7%	9%	8%	6%	7%
Liguria	3%	0%	3%	4%	3%
Lombardy	32%	36%	39%	35%	41%
Marche	2%	2%	2%	2%	3%
Piemonte	10%	12%	9%	8%	13%
Puglia	1%	2%	2%	0%	0%
Sicily	0%	1%	1%	0%	0%
Tuscany	6%	8%	8%	8%	4%
Trentino	1%	0%	0%	4%	0%
Umbria	0%	2%	2%	2%	1%
Veneto	12%	12%	8%	14%	9%
Calabria	0%	1%	0%	0%	0%
Molise	0%	0%	0%	0%	0%
Sardinia	0%	0%	1%	4%	0%
Italy	100,00%	100,00%	100,00%	100,00%	100,00%

Table 8: The private equity market in Italy (Based on data PEM Observator)

Table 11: The Private Equity in Regions of Technology Districts

Number of Observations = 355
Investigated Banks = 71
R^2 : within estimator = 0.3931
R^2 : between estimator = 0.0011
R^2 OLS estimator= 0.0674
$F(16,268) = 10.85$ Prob > F =0.0000

PROFITABILITY: DEPENDENT VARIABLE			
Explanatory Variables	*Estimates (β)*	*Standard Error*	*t-ratio*
$TDRS_{Romagna}$	-.0024776**	.0011461	-2.16
$TDRS_{Lombardy}$	-.0021535**	.0005541	-3.89
$TDRS_{Piedmont}$	.0020658	.0012354	1.67
$TDRS_{Veneto}$	.0000291	.0006221	0.05
$TCRS_{Romagna}$	-.0031443	.017865	-0.18
$TCRS_{Lombardy}$	.0327432**	.0158114	2.07
$TCRS_{Piedmont}$	.018349**	.0045764	4.01
$TCRS_{Veneto}$	.0428178	.0219142	1.95
$CFRS_{Romagna}$	.0075852**	.0020401	3.72
$CFRS_{Lombardy}$	-.0012612**	.0006273	-2.01
$CFRS_{Piedmont}$	.0286654**	.0083221	3.44
$CFRS_{Veneto}$	-.0057621**	.0024579	-2.34
$DRS_{Romagna}$	-.4008466	.5214546	-0.77
$DRS_{Lombardy}$	1.844903**	.3346828	5.51
$DRS_{Piedmont}$	-.0011445	.0023021	-0.50
DRS_{Veneto}	.5601624	.9866148	0.57
Costante	.7300348	.0078625	92.85

$F(70,268) =$ 5.52   Prob > F = 0.0000
** The estimates are significant at a confidence level α of 5%

	Banks Considered	Banks Not Considered	Total banks	Degree of representativeness
Balance sheet and Economic Aggregates	(a)	(b)	(c) =(a)+(b)	(a)/(c)%
Loans to customers	3.249.109.556	720.485.673	3.969.595.229	81,85%
Direct deposits	3.634.542.304	815.800.588	4.450.342.892	81,67%
Total Active	4.253.088.802	1.028.048.412	8.419.938.121	50,51%
Equity	313.732.341	48.613.451	362.345.792	86,58%
Profit	9.333.786	1.275.159	10.608.945	87,98%
Heritage	323.066.127	49.888.610	372.954.737	86,62%
Branches	118	18	136	86,76%

Table 12: Cooperative Credit Structure in Piedmont

	Banks Considered	Banks Not Considered	Total banks	Degree of representativeness
Balance sheet and Economic Aggregates	(a)	(b)	(c) =(a)+(b)	(a)/(c)%
Loans to customers	20.925.546.336	3.423.666.327	24.349.212.663	85,94%
Direct deposits	23.846.341.949	3.274.920.470	27.121.262.419	87,92%
Total Active	28.718.647.938	4.712.388.747	51.470.475.082	55,80%
Equity	3.236.417.469	534.791.712	3.771.209.181	85,82%
Profit	58.795.563	11.886.971	70.682.534	83,18%
Heritage	3.295.213.032	546.678.683	3.841.891.715	85,77%
Branches	671	112	783	85,69%

Table 13: Cooperative Credit Structure in Lombardy

	Banks Considered	Banks Not Considered	Total banks	Degree of representativeness
Balance sheet and Economic Aggregates	(a)	(b)	(c) =(a)+(b)	(a)/(c)%
Loans to customers	13.722.173.525	6.596.200.277	20.318.373.802	67,54%
Direct deposits	13.892.504.892	6.532.420.540	20.424.925.432	68,02%
Total Active	15.875.639.382	7.999.704.746	23.875.344.128	66,49%
Equity	1.515.822.872	782.992.119	2.298.814.991	65,94%
Profit	-13.927.424	8.251.859	-5.675.565	245,39%
Heritage	1.501.895.448	791.243.978	2.293.139.426	65,50%
Branches	362	222	584	61,98%

Table 14: Cooperative Credit Structure in Veneto

	Banks Considered	Banks Not Considered	Total banks	Degree of representativeness
Balance sheet and Economic Aggregates	(a)	(b)	(c) =(a)+(b)	(a)/(c)%
Loans to customers	9.949.526.307	655.659.247	10.605.185.554	93,82%
Direct deposits	10.336.416.164	1.336.035.373	11.672.451.537	88,55%
Total Active	12.615.073.327	1.627.387.857	14.242.461.184	88,57%
Equity	1.275.990.249	87.022.789	1.363.013.038	93,62%
Profit	47.895.318	1.573.345	49.468.663	96,82%
Heritage	1.323.885.567	88.596.134	1.412.481.701	93,73%
Branches	247	31	278	88,84%

Table 15: Cooperative Credit Structure in Emilia Romagna