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Market Finance Through Relationship Banking¹

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Abstract

Are relationship banking and market finance complements or substitutes? Some authors, stressing the incentive for firms to escape bank rent seeking, show that bank relationships weaken after companies IPO. On the contrary, another strand of literature suggests complementarity, as bank relationships bring positive news to financial markets. We study whether the likelihood of tapping financial markets depends on the intensity of bank relationships, a feature valued by external investors as providing an ex ante signal and initial additional monitoring. We find that the probability of issuing securities on financial markets is higher for firms entertaining stronger bank relationships.

JEL Classification: G1, G2, G21, G32

Keywords: relationship banking, market-based financing, initial public offering, listed company, innovative financial instruments

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1. Introduction

The linkage between relationship banking and firms' direct access to market finance is still far from clear. Specifically, are the two complements or substitutes? On one hand, a branch of the literature points to substitutability between relationship banking and firms' direct issuance of securities on the market. This literature highlights that good performing firms have an incentive to escape from rent seeking on the part of their relationship bankers and/or that financial market evolution is thwarted by relationship banking. On the other hand, a different strand of literature suggests complementarity. In particular, extant bank relationships may provide worthy signals to investors, thereby favoring new firms tapping the financial market and even improve the pricing of the securities of the companies already active on the market. According to this view, bank relationships bring positive news to financial markets.

We take the view that, while substitutability should prevail as time passes, enjoying strong bank relationships may be a key asset for companies trying to step into the market for the first time. From this perspective, we study whether the extent of bank relationships affects firms' ability to issue securities on the financial market, a move sometimes conducive to subsequent IPOs on the stock market. If our view is correct, we should observe that firms endowed with stronger bank relationships might be more likely to be able to tap financial markets. This would descend from two channels. Strong bank relationships provide: (i) an *ex ante* signal to external investors; and (ii) an initial additional monitoring. Later on, once external investors already know the company, the value of bank relationships may decrease. Hence, according to this reasoning, we expect static complementarity and dynamic substitutability between relationship banking and market financing.

We investigate our conjecture using data on Italian manufacturing firms taken from the latest two waves of the Capitalia survey. Specifically, we test whether the probability that a firm issues securities on the financial market is higher for firms entertaining strong bank relationships. Lack of an adequate number of longitudinal observations prevents, instead us from checking whether the strength of bank relationships decays over time for firms raising funds on the financial market.

In the rest of the paper, Section 2 offers an essential review of the relevant literature. Section 3 provides general information on the database and highlights the key firm features to be used in our empirical analysis. In Section 4, we present our testing strategy, report the econometric results and comment our main findings. Section 5 recaps the chief contribution of the paper.

2. Literature Background and Empirical Strategy

The conventional wisdom points to market financing being a substitute for bank credit. This tenet may be detected on two levels: the aggregate and the micro levels.

Let's start from the former, where an evolutionary view has often been put forward according to which higher stages of economic development associate with financial systems relying more on markets and less on bank credit. This lengthy debate made a leap forward when Rybczynski (1974) created the taxonomy whereby financial systems may be grouped into two archetypes: Market-based (MB) versus bank-based (BB) ones. The MB financial systems are those in which multilateral financial markets –and especially stock markets– are better developed and play a decisive role –in both qualitative and quantitative terms– in allocating funds through the economy. On the contrary, in BB financial systems multilateral financial markets are less well developed and banks –through their bilateral relations with depositors and borrowers– have a special role in the allocation of funds. By this taxonomy, the evolutionary view inaugurated by scholars like Goldsmith (1966; 1969) reached the conclusion that the passage from BB to MB

financial systems is basically a “natural evolution”. The keystone behind this approach is a “transactional” view of finance, whereby transaction costs will be minimized by multilateral markets, something that bank intermediation cannot intrinsically achieve. Thus, as industrial economies grow more affluent we should observe the deepening of financial markets together with the weakening in banks’ role. This evolutionary view had mixed fortunes since it lacked deep analytical foundations in economic theory² and because some BB systems in high performing industrial countries – such as Germany and Japan – were quite resistant to change (Mayer, 1990).

A key step forward in this debate was provided by Allen and Gale (2000). Their fundamental contribution can be synthesized briefly: BB and MB financial systems cannot be considered substitutes and ranked as superior one to the other. This conclusion derives from two distinct reasons. First, intermediaries are complementary to markets and, actually, intermediaries are needed to overcome the informational barriers to participation in markets and, thus, enable firms and investors to exploit markets effectively. Second, there is a trade-off between the two systems in terms of attaining different objectives. Specifically, on one hand, MB financial systems excel in securing a fast reallocation of resources across different sectors and, thus, at guaranteeing that the allocation of resources is efficient cross-section, at a given moment in time. On the other hand, however, MB financial systems do a relatively poor job at guaranteeing an efficient allocation of resources across time, because they cannot offer insurance against intertemporal risks, such as the risk an investor is forced to sell when asset prices collapse because of changes in market information and investors’ beliefs: Financial markets cannot (while intermediaries can) offer insurance against this risk which is essentially non-diversifiable. To the opposite, BB financial systems outperform MB ones in terms of efficient allocation of resources across time but rank second in the cross-section allocation. Thus, the relation between the two systems is best characterized as a trade-off rather than a hierarchical evolutionary process.

Accordingly, the framework proposed by Allen and Gale (2000) supports the view that banks and market finance are complements rather than substitutes and that aggregate financial systems should not converge to corner solutions, e.g. neither banks only nor financial markets only.

Also at the micro level the debate has been extensive on whether relationship banking and firms’ direct access to market finance are complements or substitutes. Without going through an exhaustive survey of the literature, quite a few papers support the existence of a substitution linkage. On theoretical grounds, the information acquired by a bank as part of an ongoing relationship can create an “information monopoly” or hold-up problem, in that it is costly for the borrower to switch lenders (Rajan, 1992, Sharpe, 1990), whereas borrowing from public markets mitigates the hold-up problem (Rajan, 1992). On the empirical level, some authors show that more credit-worthy companies rely more heavily on public debt financing (Blackwell and Kidwell, 1988); that the intensity of bank relationships – as indicated both by an increase in the number of lending banks and by a decrease in the concentration of credit among lending banks – drops after companies become listed (Pagano, Panetta and Zingales, 1998); that universal banks are less successful than specialized merchant banks in selling their clients’ securities, supposedly because their market power reduces universal banks’ incentive to apply costly underwriting efforts (Kanatas and Qi, 2003); or that relationship banks extract rents from borrowing firms³ before but not so much after the access to financial markets is made easier for them (Hoshi, Kashyap and Scharfstein, 1993; Weinstein and Yafeh, 1998). These findings are all consistent with the existence of an incentive for companies to avoid the hold up problem they undergo when

² Early on, prevailing theories of financial intermediation were mute on the relative efficiency of financial markets versus banks. And, later on, theory moved away from a “transactional” to an “informational” approach, where the substitutability between banks and markets became more questionable. See, e.g., Bhattacharya and Thakor (1993).

³ Calomiris and Pornrojngkool (2006) find that universal banks charge premiums for loans and underwriting services to extract value from combined lending and underwriting relationships.

they are informationally captured by their relationship bankers. Thereby, substitutability between relationship banking and market financing should hold.

On the other hand, a different strand of literature suggests complementarity. In particular, according to theoretical reasoning, extant bank relationships may offer financial markets precious signals to help investors' portfolio selection, depending on the fact that enduring bank relationships create information which might be otherwise not certifiable (Boot, 2000). Consistently with this prescription, on empirical grounds, James (1987), Lummer and McConnell (1989) and Best and Zang (1993) find evidence that the shares of companies been granted new (and/or favorably renewed old) bank loans experience positive abnormal returns. Furthermore, Hellmann, Lindsey, and Puri (2003) find that U.S. banks that invest in venture capital to build relationships with potential banking clients grant loans to these clients at a lower interest rate. Since stock listing is the most sought for way to capitalize gains on the part of the venture capitalist, this suggests that banks are favoring the move of the selected firms to the capital market. According to this view, bank relationships bring positive news to financial markets.

All in all, the theoretical and empirical literature devoted to the nexus between relationship banking and market financing is split among those believing in substitutability and the advocates of complementarity.

However, there may be a solution to potentially reconcile the two sides. Relationship banking and market financing might be complements when new companies enter the financial market for the first time – as their lending partners help introduce to the public these little known companies – while the two could become substitutes over time – once investors and traders have become acquainted with those companies. To be sure, support to this hypothesis is provided by the theoretical results in Diamond (1991). He shows that firms rely initially on banks, in a way to establish sufficient credibility, before accessing the capital market. Here banks give a certification to investors by means of their monitoring. As time passes, companies become “established” on the market and may abandon bank credit switching to market financing.

Other than this theoretical basis, it is worth observing that the actual experience of financial markets is suggestive of an initial complementarity between relationship banking and new firms tapping the capital market. This seems to be the case for the successful Alternative Investment Market (AIM), based in London, a new segment which has attracted to the capital market some 1,600 new firms. To be listed on AIM, firms have to be introduced by a Nominated Advisers (Nomads).⁴ From our vantage point, it is interesting to observe that even in this world leading financial market banks are a not negligible part of the Nomads.⁵

Our empirical strategy tries to ascertain whether complementarity prevails initially while substitutability ensues over a longer horizon. To do that, we consider that the path leading from the extreme node where firms use bank credit only to the node at the opposite extreme where firms are fully established on the capital market has an intermediate terrain too. In practice, we posit that being listed on stock market proxies for established companies. Then, any unlisted firm relying on external financing other than bank credit is a firm that has placed itself in the intermediate terrain. Supposedly, future stock listing is more likely for these intermediate firms than for the firms which kept using only bank credit. Yet, having moved from bank credit only to

⁴ The Nomad plays a crucial role in the admission process, carrying out pre-vetting to assess the company's suitability to join AIM, assisting it through flotation, and then being on hand once the company is on AIM to help it meet its ongoing obligations, capitalize on its AIM quotation and deal with any market issues that may arise. This and additional information regarding the AIM may be found on:

http://www.londonstockexchange.com/en-gb/products/companyservices/ourmarkets/aim_new.

⁵ If we move from London to Milan, we notice that Borsa Italiana is currently launching a new market segment – the Mercato Alternativo del Capitale (MAC) – which resembles AIM. The rules of MAC prescribe that each new firm should have as a sponsor its main bank. This seems to build in complementarity between bank financing and market financing. This and additional information regarding the MAC may be found on:

<http://www.mercatoalternativocapitale.it>.

the intermediate terrain certainly does not make these firms “established” in the eyes of traders and investors. Thus, the intermediate terrain is promising if one wants to look for the existence of the complementarity linkage between relationship banking and market finance. In the empirical part of this paper, this reasoning will be given an appropriate structure to fit the data.

3. Data with some descriptive evidence

We use the data from the Survey of Manufacturing Firms (SMF) run formerly by Mediocredito Centrale and nowadays by Capitalia, two credit institutions (Mediocredito Centrale is now part of Capitalia). Our analysis builds on the two waves run, respectively, in 2002 (covering the 1998-2000 period) and in 2004 (covering the 2001-2003 period). The data obtained from these two waves are pooled for estimation purposes. The SMF consists of the universe of firms with more than 500 employees and of a stratified sample of firms with fewer than 500 – but more than 10 – employees. In order to ensure representativeness of the smaller firms, the sample is stratified by firm size (number of employees), by sector (four sectors according to the Pavitt taxonomy) and by geographical area (North and Center-South). Each wave comprises over 4,000 firms with around 50% of the firms replaced with new firms in each survey (rotating panel).⁶

In table 1 we report the definitions and sources of the data used. While table 2 reports some descriptive statistics.

In the present analysis the endogenous variable is a dummy variable which takes value 1 if the firm has made use of innovative financial instruments (0 otherwise). The innovative financial instruments considered in the SMF comprise: mezzanine finance, commercial paper, corporate debentures, project finance, and other instruments less used in Italy, like private equity and venture capital.⁷ While the other innovative financial instruments in the list are purely debt instruments, mezzanine finance, private equity and venture capital imply that the financier participates to the firm's profit distribution. We will consider this dummy variable as reflecting arm's-length debt. Moreover, the use of the above innovative financial instruments can be viewed as an intermediate stage in the firm's process of becoming listed in the stock market. We will verify empirically this assertion.

We also have a dummy variable which takes value 1 if the firm wishes to become listed in the stock market in the next three years (0 otherwise) and a dummy variable which takes value 1 if the firm is listed (0 otherwise). We might have taken the latter dummy variable as our variable of interest. But, as it is possible to see from table 2, only 1.2 per cent of the firms are listed (and only 1.7 per cent of the firms wish to become listed) against 4.3 per cent of firms having used innovative financial instruments during the sample period. Hence, we have many more observations for the case of firms using innovative financial instruments.

The usefulness of the SMF consists in providing also detailed information on firm-bank relationships and, more in general, on firms' financial structure. Following Herrera and Minetti (2007), we use the duration of the firms' relationship with the main bank as a proxy for the informational tightness of bank-firm relationships.

In figure 1 we report the kernel densities for the duration of the bank-firm relationship for two subsamples: firms using or not using innovative financial instruments. As it is possible to see from the figure, there seems to be a ranking between the two subsamples. In particular, there is evidence of stochastic dominance (of the first order) for the subsample of firms using innovative financial instruments. This finding, although being very preliminary, suggests that some degree of complementarity might exist between the informational tightness of bank-firm relationships and market finance. We will test this hypothesis more robustly later on.

⁶ There are several reasons for requiring a replacement: firms that do not belong any longer to the manufacturing sector; firms that have reduced the number of employees below 11; firms that have ceased their activity.

⁷ The Italian market features more private equity than venture capital (Del Colle, Finaldi Russo and Generale, 2006).

To better capture size, performance and financial structure, we include the following variables: log of total assets, ROE, leverage, share of equity of the largest owner and whether the firm belongs to a credit, export or research consortium. The data derived from firms' balance sheet are taken from the AIDA databank.

We add some variables reflecting the firm's efficiency and quality of products – proxied by the ISO9000 certification – and competition – captured by a dummy variable expressing whether the firm has international competitors or not and by a dummy variable recording whether the firm has offshored the whole or part of the production abroad or not.

We considered data on the presence of banks in local markets during the 1991-1998 period: number of branches per 1,000 inhabitants in the province; Herfindahl-Hirschman Index (HHI) on bank loans in the province; new branches created by entrants or incumbents per 1,000 inhabitants in the province. All these data are based on Bank of Italy statistics and we have used the values computed in Herrera and Minetti (2007).

Moreover, we have used some variables taken from Guiso *et al.* (2004b,a). Variables describing the structure of the banking market in 1936: the share of bank branches owned by local banks, the number of saving banks per 10,000 inhabitants in the region, the number of cooperative banks per 10,000 inhabitants in the region, bank branches per 10,000 inhabitants in the region are a set of variables describing the banking market as of 1936. Social capital, which is measured by average voter turnout at the province level for all referenda in the period between 1946 and 1987. Judicial inefficiency, which is measured by the log of the number of years it takes to have a first-degree judgment in the province.

Following Ferri and Rotondi (2006) – and for the reasons better explained in that paper – we have included ID-related (Industrial District- related) variables and singled out not only firms belonging to IDs but also those specializing in the production of capital goods for the “made in Italy” final goods. However, given the very small number of firms that are both located in an ID of the “made-in-Italy” and belong to the machinery manufacturing for the “made-in-Italy” (a total number of 56), we have excluded the related dummy variable from the estimation sample.

Finally, industry and time dummies have been considered (for simplicity not reported in tables 1 and 2), with industry dummies based on a two-digit ATECO classification.

4. Methodology and main results

4.1 The empirical model

In our empirical analysis we estimate regressions on the pooled firm level data covering the 1998-2003 period and we compute heteroskedastic-robust standard errors.

The firm's choice of using innovative financial instruments can be modeled as:

$$y_i = \alpha_1 x_i + z_i \delta_{11} + u_i . \quad (1)$$

where y_i is the choice of using innovative financial instruments of firm i ; x_i is the vector of control variables, and z_i is the measure of informational tightness of bank-firm relationships under examination.

Instrumental variables (IV) are used to account for endogeneity in estimating the relation between the use of innovative financial instruments and the duration of firm-bank relationship. To fix ideas, think of the two-stage least squares interpretation of instrumental variables. First, we define a vector of instrumental variables w_i that are correlated with the explanatory variables z_i ,

but are uncorrelated with the error term u_i in the regression (1). The effect of these instruments on z_i is captured by the parameters δ_{21} in the following relationship equation:

$$z_i = w_i \delta_{21} + v_i, \quad (2)$$

where z_i is the endogenous variable in (1), w_i is the vector of instruments and v_i is the stochastic error term. After estimating the first-stage regression (2) z_i is replaced with the fitted values of z_i in the second-stage regression (1).

The instruments employed in the present empirical analysis are broadly similar to those used by Herrera and Minetti. In particular, we have a set of variables that describe the banking market in 1936, when a strict entry regulation was introduced: the share of bank branches owned by local banks, bank branches per 10,000 inhabitants in the region. Moreover, we include a variable that describes the presence of banks in local markets during the 1991-1998 period, which corresponds to a period of deregulation characterized by an intense consolidation process in the banking sector: the new branches created by incumbents per 1,000 inhabitants in the province. We refer to Herrera and Minetti (2007) for a detailed discussion on the justification of these instruments.

To ensure the validity of the chosen instruments we have to perform diagnostic checks. A good instrument must be correlated with endogenous variable and orthogonal to the error term. The first-stage regression indicates that the instrumental variables are correlated. The assumption of correlation is tested with an F-test of the excluded instruments that corresponds to Shea's (1997) "partial R-squared" measure of instrument relevance, that takes intercorrelations among instruments into account. The first-stage results are considered with small-sample statistics, to be consistent with the recommended use of the first-stage F-test as a diagnostic. As the estimated equation is reported with heteroskedastic-robust standard errors, the first-stage F-test is also heteroskedastic-robust. In turn, the assumption of orthogonality to the error term is tested using the Hansen-Sargan overidentification test. A rejection of the Hansen-Sargan overidentification test can be interpreted as either having invalid instruments and/or incorrect model specification.

We also report a test of endogeneity for the instrumented variable, i.e. the duration of firm-bank relationships. Under the null hypothesis that the specified endogenous regressor can actually be treated as exogenous, the test statistic is distributed as a chi-squared with a number of degrees of freedom equal to the number of regressors tested. The endogeneity test is implemented like the C statistic, defined as the difference of two Hansen-Sargan statistics: one for the equation with the smaller set of instruments, where the suspect regressor is treated as endogenous, and one for the equation with the larger set of instruments, where the suspect regressor is treated as exogenous. Under conditional homoskedasticity, this endogeneity test statistic is numerically equal to the Hausman test statistic (see Hayashi, 2000).

As control variables we have considered data on individual characteristics of each firm like the firm's demographics or financial structure and the features of the firm's activity related to IDs or international competition. We have included also variables describing regional or provincial characteristics like the South dummy, per capita value added, social capital, judicial efficiency, number of branches and HHI.

We have introduced some financial structure variables: total assets, ROE, leverage; whether the firm belongs to a credit, export or research consortium. Moreover, we consider the features of firm's activity related to IDs.

Unfortunately, the IV estimation method relies on the assumption of a linear probability model for the firm's choice of using innovative financial instruments. Therefore we also provide the estimates derived from a conditional maximum likelihood (IV-Probit) technique proposed in Wooldridge (2002) which does not require the assumption of a linear probability model. This technique uses maximum likelihood to estimate a probit model in the presence of an endogenous

variable. We report a Wald test of endogeneity for the instrumented variable, with the test statistic distributed as a chi-squared.

4.2 Findings

In table 3 we present the results on the determinants of the firm's choice of using innovative financial instruments. As discussed previously, this choice implies financing firm's activity with arm's-length debt. As the aim of the present analysis is to explore the interaction between relationship debt and arm's-length debt, our main concern will be the estimates obtained for the length of the bank-firm relationship. Column 1 reports the Probit estimates of the impact of the duration of the bank-firm relationship on the probability of arm's-length debt. As it is possible to see the impact is not statistically significant. In column 2 we report the estimates obtained from the IV estimation by using the chosen instruments (see previous section). Contrary to the Probit estimation, this new estimation confirms the importance of informed finance in affecting the probability of arm's-length debt. In fact, the estimated coefficient of the duration of the bank-firm relationship is positive and significant at the 5% percent level. Moreover, the first-stage F-test of excluded instruments does not reject the joint hypothesis that the instruments are correlated with the endogenous regressor, the overidentification test does not reject the joint null hypothesis that the instruments are valid, and the endogeneity test does not reject the hypothesis that the instrumented regressor can be treated as endogenous.

Hence, as shown by the IV estimation, the findings obtained from the Probit estimation are affected by an endogeneity problem. However, the IV estimation method relies on the assumption of a linear probability model. Therefore, in column 3, we also provide the estimates derived from a conditional maximum likelihood (IV-Probit) technique, which does not impose the assumption of a linear probability model. The Wald test of endogeneity confirms that the instrumented regressor can be treated as endogenous. The estimates confirm the importance of informed finance in affecting the probability of arm's-length debt. In this case the evidence is strengthened as the estimated coefficient of the duration of the bank-firm relationship is positive and significant at the 1% percent level.

As for the control variables, the most significant – and with expected signs – ones are the following. Among the individual characteristics we list belonging to a group and age (with negative sign). Among the financial structure variables, we count (all with a positive sign) total assets, belonging to a credit consortium and the share of equity of the largest owner. Among the features of the firm's activity related to IDs or international competition, we list the two cases of the firm being located in an ID but without necessarily belonging to the same industry of the district (negative sign), and whether the firm has international competitors (positive sign). Finally, among the regional and provincial characteristics, we have the number of branches and HHI (negative sign), social capital (negative sign), per capita value added (negative sign).

In conclusion, consistently with the preliminary evidence found in the descriptive analysis of the data, our findings do not reject the hypothesis that some degree of complementarity exists between the informational tightness of bank-firm relationship and the use of market finance.

4.3 Robustness

Here we perform some robustness checks by considering two further endogenous variables: firms wishing to become listed and firms being already listed. From the section on the descriptive analysis of the data, we should recall that only a limited number of firms wish to become listed or are already listed in the sample considered. This feature represents an important caveat for the findings obtained in this section.

As discussed above we consider the use of innovative financial instruments as reflecting arm's-length debt. Moreover, the use of innovative financial instruments can be considered as an intermediate stage in the firm's process of becoming listed in the stock market. Here we verify the robustness of this latter assertion by examining the determinants of the desire to become listed. The findings of this exercise are reported in table 4. As it is possible to see from the table, the variable "innovative financial instruments" has a positive and significant (at the 10 per cent level of confidence) impact only in the case of the Probit estimation, reported in the first column. Nevertheless, the endogeneity test rejects the hypothesis that the instrumented regressor can be treated as endogenous in both the IV and IV-Probit estimation. Hence, the relevant estimation should be considered that based on the standard Probit estimation. Accordingly, our evidence supports the view that using innovative financial instruments represents for firms an intermediate stage before becoming listed.

A further robustness check that we perform consists in examining the determinants of the firm's choice of being already listed. Here our variable of interest is again the length of the bank-firm relationship. The findings of this exercise are reported in table 5. As it is possible to see, the results are similar to what found in the case of innovative financial instruments. Hence, also this latter exercise confirms that the existence of some degree of complementarity between the informational tightness of bank-firm relationship and market finance.

5. Conclusions

In this paper, we have tested the link between relationship banking and firm access to financial markets. We have argued that the extant literature yields conflicting predictions on the nature of this link. While some studies predict that tight credit relationships should ease firm access to capital markets (complementarity), others suggest instead that firms should use capital markets to escape the hold-up problem typically associated with relationship finance (substitutability). The analysis delivers clear-cut results. We have found that firms with longer relationships with their main banks have a higher probability of using innovative financial instruments. Furthermore, long credit relationships appear to promote firm access to the stock market.

The results are in line with the structural characteristics of the Italian financial system. In fact, in Italy banks play a critical role in firm development and it is thus natural that dispersed investors rely on the certification and monitoring role of banks when deciding whether to grant funds to firms. An important aspect that the analysis leaves unanswered is what role the degree of technological innovativeness plays in the link between relationship finance and the use of innovative financial instruments. We leave this and other issues for future research.

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TABLE 1 – Variables: definition and source

	Definition	Source
Innovative financial instruments	Dummy that takes the value 1 if the firms used innovative financial instruments; 0 otherwise	Capitalia Survey
Relationship length	Log of the number of years of the relationship between the firm and its main bank	Capitalia Survey
Same province of the main bank	Dummy that takes the value 1 if the firm has its headquarter in the same province of its main bank; 0 otherwise	Capitalia Survey
Branches	Average number of branches per 1000 inhabitants in the province during the 1991-1998 period	Herrera-Minetti (2007)
Herfindahl	Average Herfindahl-Hirschman Index on bank loans in the province during the 1991-1998 period	Herrera-Minetti (2007)
Total assets	Log of total assets	AIDA
ROE	Return on equity	AIDA
Leverage	Ratio of financial debt to financial debt plus net capital	AIDA
Major owner	Share of equity of the largest owner	Capitalia Survey
Listed	Dummy that takes the value 1 if the firm is listed in the stock market; 0 otherwise	Capitalia Survey
Wish to become listed	Dummy that takes the value 1 if the firm wishes to become listed in the stock market in the next three years; 0 otherwise	Capitalia Survey
Credit consortium	Dummy that takes the value 1 if the firm belongs to a credit consortium; 0 otherwise	Capitalia Survey
Export consortium	Dummy that takes the value 1 if the firm belongs to a export consortium; 0 otherwise	Capitalia Survey
Research consortium	Dummy that takes the value 1 if the firm belongs to a research consortium; 0 otherwise	Capitalia Survey
Corporation	Dummy that takes the value 1 if the firm is a corporation; 0 otherwise	Capitalia Survey
Group	Dummy that takes the value 1 if the firm belongs to a group; 0 otherwise	Capitalia Survey
Age	Log of the number of years of the firm from its foundation	Capitalia Survey
Size	Log of the number of employees	Capitalia Survey
Judicial inefficiency	Judicial inefficiency as measured by the number of years it takes to have a first-degree judgement in the province	Guiso <i>et al.</i> , 2004b
Social Capital	Social capital is measured by average voter turnout at the province level for all referenda in the period between 1946 and 1987	Guiso <i>et al.</i> , 2004b
Per capita value added	Per capita value added in the province of 1991	ISTAT
Share of bank branches owned by local banks in 1936	Share of bank branches owned by local banks in 1936 province	Guiso <i>et al.</i> , 2004a
Number of saving banks in the region in 1936	Number of saving banks per 10,000 inhabitants in the region in 1936	Guiso <i>et al.</i> , 2004a
Bank branches in the region in 1936	Bank branches per 10000 inhabitants in the region in 1936	Guiso <i>et al.</i> , 2004a
Number of cooperative banks in the region in 1936	Number of cooperative banks per 10,000 inhabitants in the region in 1936	Guiso <i>et al.</i> , 2004a
New branches entrants	Average number of new branches created by entrants per 1,000 inhabitants in the province during the 1991-1998 period	Herrera-Minetti (2007)
New branches incumbents	Average number of new branches created by incumbents per 1,000 inhabitants in the province during the 1991-1998 period	Herrera-Minetti (2007)

(continued)

TABLE 1 – Variables: definition and source (continued)

	Definition	Source
Offshoring	Dummy that takes the value 1 if the firm has offshored abroad part of (or the whole) of production; 0 otherwise	Capitalia Survey
International competitors	Dummy that takes the value 1 if the firm has international competitors; 0 otherwise	Capitalia Survey
ISO9000 certified	Dummy that takes the value 1 if the firm is ISO9000 certified; 0 otherwise	Capitalia Survey
South	Dummy that takes the value 1 if the firm is located in a region South of Rome, with Lazio excluded; 0 otherwise	Capitalia Survey
Located in an industrial district and belongs to the same industry of the district	Dummy that takes the value 1 if the requirement for the firm reported left is satisfied; 0 otherwise	Capitalia Survey
Located in an industrial district but not necessarily belongs to the same industry of the district	Dummy that takes the value 1 if the requirement for the firm reported left is satisfied; 0 otherwise	Capitalia Survey
Located in an industrial district of the made-in-Italy but not necessarily belongs to the same industry of the district	Dummy that takes the value 1 if the requirement for the firm reported left is satisfied; 0 otherwise	Capitalia Survey
Located in an industrial district and belongs to the machinery manufacturing industry	Dummy that takes the value 1 if the requirement for the firm reported left is satisfied; 0 otherwise	Capitalia Survey
Located in an industrial district and belongs to the machinery manufacturing for the made-in-Italy industry	Dummy that takes the value 1 if the requirement for the firm reported left is satisfied; 0 otherwise	Capitalia Survey
Located in an industrial district of the made-in-Italy and belongs to the machinery manufacturing for the made-in-Italy industry	Dummy that takes the value 1 if the requirement for the firm reported left is satisfied; 0 otherwise	Capitalia Survey

TABLE 2 – Summary statistics

	MEDIAN	MEAN	1st PERCENTILE	99th PERCENTILE	STANDARD DEVIATION
Innovative financial instruments	0	0.043	0	1	0.203
Relationship length (not in log)	12	14.578	0	52	12.093
Same province of the main bank	1	0.599	0	1	0.490
Branches	0.473	0.460	0.202	0.795	0.118
Herfindahl	0.064	0.070	0.036	0.196	0.028
Total assets	6.693	6.792	5.801	8.662	0.615
ROE	4.728	5.204	-54.318	53.517	17.936
Leverage	0.923	0.885	0.467	0.998	0.118
Major owner	0.5	0.579	0.02	1	0.281
Listed	0	0.012	0	1	0.108
Wish to become listed	0	0.017	0	1	0.128
Credit consortium	0	0.030	0	1	0.170
Export consortium	0	0.017	0	1	0.130
Research consortium	0	0.005	0	0	0.070
Corporation	1	0.959	0	1	0.198
Group	0	0.261	0	1	0.439
Age	3.135	3.069	1.386	4.585	0.676
Size	3.466	3.767	2.398	7.179	1.111
Judicial inefficiency	2.872	3.266	1.883	7.467	1.003
Social Capital	0.86	0.840	0.660	0.910	0.062
Per capita value added	2.663	2.613	1.997	3.000	0.235
Share of bank branches owned by local banks in the region in 1936	0.886	0.811	0.507	0.972	0.143
Number of saving banks in the region in 1936	0.032	0.029	0	0.102	0.027
Bank branches in the region in 1936	2.219	2.452	0.828	5.305	1.190
Number of cooperative banks in the region in 1936	0.060	0.087	0	0.217	0.059
New branches entrants	0.002	0.003	0	0.009	0.002
New branches incumbents	0.024	0.024	0.008	0.042	0.009

(continued)

TABLE 2 – Summary statistics (continued)

	MEDIAN	MEAN	1st PERCENTILE	99th PERCENTILE	STANDARD DEVIATION
Offshoring	0	0.047	0	1	0.212
International competitors	0	0.344	0	1	0.475
ISO9000 certified	0	0.473	0	1	0.499
South	0	0.154	0	1	0.361
Located in an industrial district and belongs to the same industry of the district	0	0.135	0	1	0.342
Located in an industrial district but not necessarily belongs to the same industry of the district	0	0.480	0	1	0.500
Located in an industrial district of the made-in-Italy but not necessarily belongs to the same industry of the district	0	0.307	0	1	0.461
Located in an industrial district and belongs to the machinery manufacturing industry	0	0.073	0	1	0.260
Located in an industrial district and belongs to the machinery manufacturing for the made-in-Italy industry	0	0.011	0	1	0.104
Located in an industrial district of the made-in-Italy and belongs to the machinery manufacturing for the made-in-Italy industry	0	0.006	0	0	0.079

TABLE 3 – Determinants of using innovative financial instruments

	Probit		IV		IV-Probit	
	Coefficient	s.e.	Coefficient	s.e.	Coefficient	s.e.
Relationship length	-0.045056	0.044594	0.338407**	0.130978	1.629824***	0.072275
Branches	0.286942	0.347963	0.144808**	0.065840	0.638111***	0.199118
Herfindahl	-1.718789	1.255998	-0.486345**	0.211263	-2.056103***	0.730725
Leverage	0.377326	0.263514	0.031969	0.032996	0.092203	0.144987
Total assets	0.306114***	0.101774	0.053395***	0.017229	0.220094***	0.063596
ROE	-0.001354	0.001725	-0.000119	0.000201	-0.000532	0.000853
Offshoring	0.111221	0.127596	-0.011841	0.021203	-0.073904	0.071937
Major owner	-0.075853	0.114384	0.032709	0.021310	0.168109***	0.062247
Credit consortium	0.437422***	0.135402	0.063665**	0.028816	0.188078*	0.102467
Export consortium	0.145382	0.202813	-0.016415	0.031850	-0.098324	0.109428
Research consortium	0.218280	0.324164	0.073643	0.075021	0.283588	0.229293
Corporation	0.141131	0.146347	0.002158	0.022265	-0.014653	0.083742
Group	0.091953	0.079218	0.048344***	0.017980	0.209952***	0.042558
Age	0.053273	0.048523	-0.169132**	0.067108	-0.822442***	0.048028
Size	0.016816	0.051407	-0.007429	0.008408	-0.042484	0.029145
International competitors	0.123670*	0.065164	0.018622**	0.008812	0.082438**	0.036136
ISO9000 certified	0.076809	0.066775	0.006207	0.008174	0.021529	0.035519
Per capita value added	-0.594092***	0.219169	-0.091023***	0.033093	-0.371963***	0.130111
Judicial inefficiency	-0.065014	0.130053	-0.014417	0.017298	-0.072335	0.064990
Social Capital	0.307556	1.036984	-0.235223	0.164511	-1.066832*	0.565515
South	-0.073648	0.175855	-0.003581	0.022022	0.004728	0.091637
Located in an industrial district and belongs to the same industry of the district	-0.126056	0.113682	-0.009425	0.013409	-0.035601	0.059473
Located in an industrial district but not necessarily belongs to the same industry of the district	-0.042567	0.095728	-0.018543	0.012893	-0.084053*	0.048871
Located in an industrial district of the made-in-Italy but not necessarily belongs to the same industry of the district	0.050725	0.093618	0.003800	0.011204	0.021144	0.047429
Located in an industrial district and belongs to the machinery manufacturing industry	0.138314	0.183980	0.018103	0.021352	0.078080	0.094891
Located in an industrial district and belongs to the machinery manufacturing for the made-in-Italy industry	0.095019	0.298671	0.038974	0.041154	0.170239	0.159283
<i>Observations</i>	6346		6343		6343	
<i>Wald test, χ^2-statistic</i>	215.11***				3194.63***	
<i>F-test, F-statistic</i>			1.64**			
<i>Test of excluded instruments, F-statistic</i>			4.33***			
<i>Endogeneity test of instrumented regressor, χ^2-statistic</i>			15.47***		20.67***	
<i>Overidentification test, Hansen J-statistic</i>			4.09***			

Notes: Pooled regressions. The left-hand variable is a dummy equal to 1 if the firm has declared to have used innovative financial instruments in the period covered by the survey (1998-2000 or 2001-2003), and 0 otherwise. For the definition and source of the variables see table 1. IV and IV-Probit use as instruments a set of variables that describes the banking market as of 1936 (see Guiso *et al.*, 2004a) and a set of variables that describes shocks to the local supply of banking services for the 1991-1998 period (see Herrera and Minetti 2007). All regressions include constant, industry and time dummies. Robust standard errors are reported. (*): coefficient significant at 10 percent; (**): coefficient significant at 5 percent; (***): coefficient significant at less than 1 percent. See the section on the methodology for the definition of the test statistics reported in the table.

TABLE 4 – Determinants of the wish to become listed

	Probit		IV		IV-Probit	
	Coefficient	s.e.	Coefficient	s.e.	Coefficient	s.e.
Innovative financial instruments	0.274820*	0.152080	0.117063	0.180406	2.772394	3.290069
Branches	0.338016	0.545153	0.012984	0.021442	0.272699	0.529780
Herfindahl	0.538332	2.033215	0.003914	0.097814	1.039126	1.828873
Leverage	0.438255	0.350565	0.018398	0.015010	0.334881	0.396503
Total assets	0.349855**	0.146207	0.008232	0.008268	0.240125	0.259932
ROE	0.007056***	0.002574	0.000244***	0.000091	0.006284*	0.003263
Offshoring	0.360715**	0.151102	0.026021*	0.013332	0.294472	0.223853
Major owner	0.020368	0.167767	0.001297	0.007444	0.040715	0.150115
Credit consortium	0.047929	0.231633	-0.003032	0.013962	-0.083098	0.279786
Export consortium	0.532565**	0.225426	0.024552	0.018242	0.431555	0.313955
Research consortium	0.580250*	0.333447	0.060436	0.054618	0.400221	0.480656
Corporation	0.788246**	0.338617	0.018580***	0.006125	0.672883	0.476824
Group	0.509970***	0.101182	0.023073***	0.005646	0.422088*	0.236858
Age	0.040246	0.064946	0.001470	0.002902	0.028064	0.061860
Size	0.000351	0.074051	0.002932	0.003569	-0.005881	0.064455
International competitors	0.048879	0.097127	0.001109	0.004101	0.022999	0.094994
ISO9000 certified	0.074343	0.096982	0.001847	0.003519	0.053799	0.098390
Per capita value added	-0.417598	0.327308	-0.011460	0.015255	-0.250772	0.417532
Judicial inefficiency	0.230269	0.186731	0.012363	0.008033	0.218792	0.179083
Social Capital	0.075413	1.445991	-0.001315	0.058443	-0.019543	1.271681
South	0.006743	0.229801	0.000649	0.010010	0.021658	0.202551
Located in an industrial district and belongs to the same industry of the district	-0.227189	0.175053	-0.008283	0.006055	-0.187056	0.177670
Located in an industrial district but not necessarily belongs to the same industry of the district	0.000219	0.153020	0.000384	0.004959	0.015325	0.135682
Located in an industrial district of the made-in-Italy but not necessarily belongs to the same industry of the district	0.138119	0.137641	0.004842	0.004892	0.107278	0.137406
Located in an industrial district and belongs to the machinery manufacturing industry	0.285518	0.231666	0.009449	0.010594	0.216274	0.258589
Located in an industrial district and belongs to the machinery manufacturing for the made-in-Italy industry	0.332629	0.302531	0.022910	0.025316	0.307984	0.282554
<i>Observations</i>	6206		6434		6434	
<i>Wald test, χ^2-statistic</i>	205.17***				2735.97***	
<i>F-test, F-statistic</i>			2.88***			
<i>Test of excluded instruments, F-statistic</i>			4.74***			
<i>Endogeneity test of instrumented regressor, χ^2-statistic</i>			0.53		0.38	
<i>Overidentification test, Hansen J-statistic</i>			1.35***			

Notes: Pooled regressions. The left-hand variable is a dummy equal to 1 if the firm desires of becoming listed in the stock market in the next three years, and 0 otherwise. For the definition and source of the variables see table 1. IV and IV-Probit use as instruments a set of variables that describes the banking market as of 1936 (see Guiso *et al.*, 2004a) and a set of variables that describes shocks to the local supply of banking services for the 1991-1998 period (see Herrera and Minetti 2007). All regressions include constant, industry and time dummies. Robust standard errors are reported. (*): coefficient significant at 10 percent; (**): coefficient significant at 5 percent; (***): coefficient significant at less than 1 percent. See the section on the methodology for the definition of the test statistics reported in the table.

TABLE 5 – Determinants of being listed

	Probit		IV		IV-Probit	
	Coefficient	s.e.	Coefficient	s.e.	Coefficient	s.e.
Relationship length	-0.019508	0.081339	0.108204**	0.046720	1.650069***	0.076214
Branches	0.053225	0.700846	0.034092	0.025807	0.520342**	0.252432
Herfindahl	4.680511**	2.283373	-0.036964	0.071833	-0.271736	1.051215
Leverage	-0.091165	0.402473	-0.009189	0.014651	-0.025402	0.164330
Total assets	0.682018***	0.193351	0.027820***	0.007773	0.329262***	0.113148
ROE	-0.000975	0.002690	-0.000036	0.000079	-0.000281	0.001020
Offshoring	0.017186	0.169291	-0.000728	0.010919	-0.098965	0.077792
Major owner	-0.446790**	0.203314	0.001636	0.008310	0.060247	0.102413
Credit consortium	0.260323	0.301190	0.005061	0.008835	0.127967	0.125349
Research consortium	0.325886	0.359717	0.050042	0.045577	0.294727	0.230509
Corporation	0.345140	0.380895	0.001605	0.007151	0.062056	0.141616
Group	0.596228***	0.137125	0.027112***	0.007439	0.351508***	0.078387
Age	-0.150354*	0.088588	-0.060011**	0.024310	-0.893647***	0.038597
Size	-0.016299	0.092954	-0.000870	0.003420	-0.055244	0.035659
International competitors	0.024068	0.123735	0.003097	0.003548	0.044756	0.044255
ISO9000 certified	0.196657	0.130364	0.000961	0.002862	0.052812	0.052075
Per capita value added	0.619316*	0.365526	0.002545	0.011859	-0.028001	0.162396
Judicial inefficiency	-0.079264	0.263484	-0.004844	0.006930	-0.090904	0.086947
Social Capital	1.298557	1.884506	-0.062452	0.061508	-0.841116	0.747492
South	0.250070	0.348133	0.004654	0.009548	0.096938	0.126999
Located in an industrial district and belongs to the same industry of the district	0.149293	0.244962	0.000342	0.005259	0.049207	0.085404
Located in an industrial district but not necessarily belongs to the same industry of the district	-0.138201	0.182058	-0.005951	0.004983	-0.104055	0.066385
Located in an industrial district of the made-in-Italy but not necessarily belongs to the same industry of the district	0.081039	0.189944	0.001405	0.004329	0.030894	0.067207
Located in an industrial district and belongs to the machinery manufacturing industry	-0.076669	0.377079	0.002330	0.008020	0.007998	0.131815
Located in an industrial district and belongs to the machinery manufacturing for the made-in-Italy industry	0.957758**	0.392114	0.039014	0.025713	0.412588*	0.221841
<i>Observations</i>	6101		6350		6297	
<i>Wald test, χ^2-statistic</i>	241.31***				3528.62***	
<i>F-test, F-statistic</i>			1.76**			
<i>Test of excluded instruments, F-statistic</i>			4.63***			
<i>Endogeneity test of instrumented regressor, χ^2-statistic</i>			9.13***		15.46***	
<i>Overidentification test, Hansen J-statistic</i>			0.72***			

Notes: Pooled regressions. The left-hand variable is a dummy equal to 1 if the firm has been listed in the stock market during the period covered by the survey (1998-2000 or 2001-2003), and 0 otherwise. For the definition and source of the variables see table 1. IV and IV-Probit use as instruments a set of variables that describes the banking market as of 1936 (see Guiso *et al.*, 2004a) and a set of variables that describes shocks to the local supply of banking services for the 1991-1998 period (see Herrera and Minetti 2007). All regressions include constant, industry and time dummies. Robust standard errors are reported. (*): coefficient significant at 10 percent; (**): coefficient significant at 5 percent; (***): coefficient significant at less than 1 percent. See the section on the methodology for the definition of the test statistics reported in the table. The variable “export consortium” has been dropped from the estimation for collinearity reasons.

Figure 1 - Kernel density of the duration of the bank-firm relationship

