



DO BANK-FIRM RELATIONSHIPS INFLUENCE FIRM
INTERNATIONALIZATION?

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Abstract

We show that a longer relationship length with the main bank fosters Italian firms' foreign direct investment (FDI) and, weakly, production off-shoring abroad. Possibly, longer bank relationships help secure external financing for these companies, which have become more opaque because of their internationalization. In contrast, other than for smaller-sized companies, we detect no impact on firms' propensity to export, suggesting that exporting alters enterprises' financial set-up less than shifting production internationally. We also find a link between the internationalization of the main creditor bank and firm FDIs. Our evidence suggests that preexisting strong bank-firm relationships support manufacturing firms' production internationalization.

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1. Introduction

Internationalization is among the main channels through which firms' growth materializes. This applies when internationalization takes either its weaker form, that of export, or when companies allocate abroad some production activities (off-shoring), or when internationalization turns to its stronger form, namely foreign direct investments (FDIs).

The three forms of internationalization have a double impact on firms external financing. On the one hand, the need for external financing increases, especially because internationalization implies sunk costs. On the other hand, obtaining external financing becomes more difficult. The company increases its financial needs while its assets and business become more opaque, because of geographic distance and institutional differences. Therefore, it may be advantageous for international firms to have a strong relationship with their main bank, especially when the latter is also internationalized.

We can put forward three working hypotheses: i) a non financial enterprise's internationalization is more likely when it has a stronger relationship with its main bank; ii) the beneficial impact of a more intense relationship with the main bank is greater for FDIs, a bit smaller for off-shoring and the smallest for exports, because of decreasing sunk costs of the three routes to internationalization; iii) the positive impact of relationship banking is largest when the principal bank is itself also internationalized. In a nutshell, the main task of the paper is to identify the determinants of Italian enterprises' activities abroad, while assigning a key role to a proxy measuring the intensity of the bank-firm relationship.

The paper is divided into five Sections. Section 2 hosts a survey of the literature on internationalization of enterprises and banks. Section 3 illustrates the statistics. Section 4 presents our econometric strategy and results on whether relationships with banks affect companies' internationalization. Finally, Section 5 recaps our main results.

2. Literature on firms and banks' internationalization

Any company has to choose whether to keep its entire business domestic or shift part of it abroad, thus becoming a multinational enterprise. That choice depends on a series of determinants. It is useful to distinguish three different forms of internationalization: foreign direct investments (FDI),

international off-shoring of production (off-shoring) and exports¹.

We start with the differences between FDIs and international off-shoring. While FDIs aim to improve export penetration in final markets and typically target industrialized countries, the primary objective of international off-shoring is to reduce production costs by shifting production to countries enjoying lower costs, generally emerging and/or developing countries. As the aims differ between FDIs, on the one hand, and international off-shoring of production, on the other, the determinants also differ (Barba Navaretti and Venables, 2004). Some determinants pertain to firms' features and their production process: economies of scale at the firm or plant level; trade costs specific to the product; costs stemming from the disintegration of production phases; differences in factor intensity across production phases (e.g. capital vs. labor; skilled vs. unskilled labor).

A second set of determinants relates to the variables affecting the target geographic choice: trade costs specific to the selected country (e.g. distance and trade barriers) and market size. The ideal candidates for FDIs are countries which are distant and have high trade barriers, while international off-shoring of production is attracted by countries which are close and/or may be reached with low transportation costs.

Internationalization of production is more likely for larger-sized enterprises, since it entails big sunk costs (Helpman, Melitz and Yeaple, 2003). The costs involved in the internationalization of production take various shapes. For example, investors undertake the risk that initially favorable conditions – e.g. tax exemptions and other incentives to incoming FDIs – might change subsequently, to the point of causing divesting at an unfavorable time, thus inducing large losses with respect to the initial investment cost, since capital goods are not easily re-deployable in the sense described by Williamson (1979).

Also exports have sunk costs. To become an exporter, a company must devote resources to identify its specific export market and undertaking the adjustment needed to make its products adequate to that market, tailoring them to local tastes and conforming to the target country's regulations (Bugamelli and Infante, 2003). These sunk costs – which vary depending on the nature of the exported item and of the distance to the exporting market – include, for example, R&D expenses, marketing and translation costs. Those investments are sunk in the sense that they will be lost in case the company discontinues exporting that product in that market. Sunk costs differ and are specific for each product type and national destination market, so that most companies end up exporting just

¹ In theory, a further case exists in which a non exporting company offshores abroad some of its production but keeps its sales exclusively on the domestic market. In practice, however, only already exporting firms offshore production (Benfratello and Razzolini, 2007).

a few products to a limited number of countries (Helpman et al. 2008; Chaney, 2005). The literature points to those sunk costs as a key factor helping explain a series of puzzles, such as why the intensity of international trade – even though increasing – is still relatively low or why the export growth of countries whose exchange rate depreciates lags until depreciations become large. Using a sample of companies from Columbia, Roberts and Tybout (1997) find that the probability of exporting is 60% larger for companies which had past exporting experience.

From an accounting perspective, with internationalization the goodwill capital of the firm might increase but part of it is now abroad. From the perspective of economic theory, this intensifies the company's asymmetries of information vis-à-vis its domestic banks both because the firm experiences a rising ratio of intangible capital – in its goodwill component – to tangible capital (where only the latter may be used as collateral) and, most importantly, because the increase in intangible capital takes place abroad, in a distant context for the domestic bank. Accordingly, the bank's ability to classify the company's credit worthiness may worsen with respect to its previous status of a domestic firm.

We can state a hierarchy among the sunk costs connected to the different forms of productive internationalization. Sunk costs should be largest for FDI's because these imply moving the entire production cycle abroad – by replicating the domestic plant there – rather than shifting only some of the production phases abroad, as in the case of international off-shoring. Probably the lowest sunk costs are those linked to the choice to export.

Internationalization implies not only sunk costs but also greater asymmetries of information between firms and banks. The financial implications of company internationalization have attracted attention in the literature. Various papers try to test whether internationalization is more likely for those firms active in countries enjoying more intense financial development. Most of these studies address the link between financial development and export. The underlying idea is that, against the firm's rising financial needs and in the face of the intensified asymmetry of information for the newly international company, better developed financial setups may help mitigate the problem. For instance, in a cross-country comparison over 30 years, Beck (2002) finds that countries with more developed financial systems show a larger share of manufacturing exports over GDP. Extending the analysis to the industrial sector level, Becker and Greenberg (2005) find that the degree of financial development increases exports and that such an impact is stronger for those industries with larger fixed costs. Furthermore, some studies ask the question on firm level data. On the basis of a large sample of companies from Argentina, Espanol (2007) reports that the probability for a firm to

become an exporter rises when it has better access to finance (measured through the answers the firms gives to a questionnaire). Analogously, using a large sample of Italian enterprises, Grisorio (2007) finds that the probability for a firm to start exporting increases along with the degree of financial development (measured by the number of per capita bank branches) of the province where the firm is located.

As we will discuss in more detail below, our analysis of the impact of the financial context on the firm's choice to internationalize differs with respect to the quoted works. We introduce a measure of relationship banking – the length of the relationship between the firm and its main bank – that the literature has already proved to be a good proxy of the extent to which the firm has access to external finance (Herrera and Minetti, 2007; Ferri and Rotondi, 2006; Ferri, Minetti and Rotondi, 2007). We conjecture that as the intensity of relationship banking rises it should become easier for firms to go international without being penalized in their access to external finance because of their increased opaqueness. According to our *a priori*, we may expect that the favorable impact of relationship banking should vary along with the intensity of the problems posed by the various forms of company internationalization. Taking into account our previous classification of sunk costs connected to internationalization, the favorable impact of relationship banking should be smallest for exports, a little larger for international off-shoring of production, and largest for FDIs.

Another goal of this paper is to test the existence of a link between bank internationalization and firm one. Banks go abroad for different reasons. One is risk diversification: to be active in different countries helps dealing with idiosyncratic shocks in any specific country. Second, banks internationalize to enter profitable markets, for example economies with a high rate of growth. According to Focarelli and Pozzolo (2001), banks buying foreign subsidiaries are usually large and come from developed credit systems: these large intermediaries enter markets where banks are less efficient, with the aim of restructuring to save costs. Third, banks' expansion abroad may be explained by the search for scale and scope economies. Fourth, banks active in high concentrated markets may be forced to go abroad because antitrust authorities may limit further national expansion. Fifth, when firms go abroad, banks follow suit in order to maintain the links built within the national borders. In studying the determinants of Italian banks' foreign expansion, Paladino (2007) emphasizes the issue of quality of foreign institutions and infrastructure, the role of parent bank size and the commercial integration between countries. Another issue concerns the form of the foreign presence: branches are mainly active in wholesale markets, especially in the interbank segment, while the subsidiaries are more focused on retail markets. Branches tend to be more

localized in large financial centres, with London in first place, while the subsidiaries are more present in emerging markets (Focarelli and Pozzolo, 2005).

Finally, a traditional question asked in the literature is whether bank internationalization follows firm internationalization or not. The general answer to such a question used to be positive (Buch and Lapp, 1998; Buch, 2000; Miller and Parkhe, 1998). However, other studies find more complex answers. Seth, Nolle and Mohanty (1998) observe that the hypothesis “follow the customer” was becoming too restrictive. These authors note that the largest part of loans granted abroad by banks did not finance national firms active on foreign markets. Similarly Focarelli and Pozzolo (2005) underline that banks’ motivation to go abroad is to achieve higher profits rather than to follow their national customers. Yamori (1998) finds that Japanese banks’ FDIs were influenced originally by the FDIs of the country’s multinational but are also sensible to the conditions of the destination markets. In examining the Japanese firms’ FDIs in Europe, von der Ruhr and Ryan (2005) show how initially industrial FDIs attract the banking ones; subsequently the banking FDIs attract new industrial FDIs. In analysing the Chinese case, He and Gray (2001) find that non financial FDIs increase strongly in those regions where banks previously invested. Even if this paper does not contain information on the country origin of banking and industrial FDIs, it is plausible to think that there is a casual link going from the first to the latter also on a national base.

Now we turn the empirical part of our paper.

3. Statistics

We collected both firm and bank statistics. The data on companies are taken from the Survey of Manufacturing Firms (SMF) of Unicredit, an Italian bank². Our analysis is based on the surveys carried out in 2002 (with reference to the period 1998-2000) and in 2004 (with reference to the years 2001-03). The SMF considers the universe of firms with more than 500 employees and a stratified sample of firms with less than 500 – but more than 10 – employees. To ensure the statistical representativeness of the smallest firms, the sample is stratified on the basis of firm size (number of employees), sector (four sectors according to the Pavitt classification) and geographical area (North and Center-South). Each survey takes into account more than 4,000 firms; around 50% of the firms are replaced with other firms in every survey (rotating panel). The reasons that justify the replacement of firms in subsequent surveys are various: some firms may leave the manufacturing

² The survey was originally carried out by Mediocredito Centrale, then by Capitalia, and now, after the merger between UniCredit and Capitalia, by UniCredit.

sector; other enterprises may decrease the number of employees under the threshold of eleven; other companies have closed their business.

Our endogenous variable is binary: it is equal to 1 if the firm made a foreign direct investment (FDI), if it offshored the whole or part of the production abroad or if it exported; otherwise (i.e., if the firm did not internationalise), the variable is equal to zero. The exogenous variables of interest include indicators of the relationship between the bank and the firm: the length of the credit relationship with the principal bank and the presence of the main bank abroad. We know whether the main bank has branches or subsidiaries abroad and if it is a joint-stock bank, a popular cooperative bank or a credit cooperative. The bank information is mainly taken from Banca d'Italia prudential statistical returns.

We took into account some control variables concerning the company's financial structure that might influence the length of the credit relationship: the logarithm of total assets, the return on equity (ROE), the return on investment (ROI), the leverage, the participation to a mutual loan guarantee consortia or to an export consortia. Other control variables refer to innovative financial instruments eventually used by the firms, such as mezzanine finance, commercial paper, corporate debentures, project finance, private equity and venture capital. We included some variables on the efficiency and quality product of the firms, approximated by the ISO9000 certification, and on firm competitiveness, measured by the presence of international competitors. We considered some variables on industrial districts (taken from Ferri and Rotondi, 2006) that might affect the bank-firm link. Also social capital might influence the bank-firm relationship: it is measured as the average percentage of the eligible voters per province for all the referenda proposed in Italy in the period between 1946 and 1987. We also included some variables which capture regional or provincial characteristics: a dummy variable for the South, per capita value added at the provincial level, and the Herfindahl index of loans. Some dummies served as controls for the possible effects of the business cycle and the firm sector (in the latter case using the two digit SITC classification).

Table 1 shows the definitions and the sources of the statistics. We also reckoned three indicators as instrumental variables for the duration of the bank-firm relationship (see Section 4 for the use of these variables): the number of branches per 1,000 citizens in the provinces during the 1991-98 period; the new branches for 1,000 citizens created by new entrants in each province during the years 1991-98; the number of saving banks per 10,000 citizens in the regions in 1936. Table 2 contains some descriptive statistics.

Now we turn to the econometric exercises.

4. Econometric strategy and results

Following Herrera and Minetti (2007) and Ferri, Minetti and Rotondi (2007), we consider the length of the relationship between a firm and its main bank as the key explanatory variable. This variable can be interpreted as a proxy for the intensity of the bank-firm relationship (*informational tightness*). To check the robustness of the link between firm's internationalization and the length of its banking relationship, we introduce further regressors, such as firm indicators and variables describing the local economy.

The choice of moving production abroad or exporting can be modeled in the following way:

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

where y_i is the choice of internationalization (FDIs, off-shoring or exports) of firm i ; x_i is a vector of control variables and z_i measures the intensity of the bank-firm relationship.

In the literature the method of instrumental variables (IV) is applied to solve endogeneity problems among the dependent and the independent variables. We account for the possible presence of endogeneity in the relationship between the choice of internationalization and the length of the bank-firm relationship. Considering the interpretation of instrumental variables given by Two Stages Least Squares (TSLS), we first define a vector of instrumental variables w_i correlated with the endogenous explanatory variable z_i , but uncorrelated with the stochastic error u_i in regression (1). The effect of these instrumental variables is captured by the vector of parameters δ_{21} in the following auxiliary regression:

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

where z_i is the endogenous explanatory variable in (1), w_i is the vector of instrumental variables and v_i is white noise. After estimating regression (2) at the first stage, z_i is replaced by its estimated values in regression (1). This last equation is then estimated at the second stage. Our econometric strategy was influenced mainly by two papers.

First, Guiso *et al.* (2004a) have examined the effect of regional financial development on economic performance, finding a positive influence. As this positive correlation might depend on a causal nexus going from economic performance to financial development, they use a set of economic variables to instrument their indicator of local financial development. These instruments refer to the regional banking structure in 1936: branches per inhabitants, fraction of branches owned by local banks, number of saving banks per inhabitants, number of cooperative banks per inhabitants. This old regional banking structure was not correlated with the historical economic development of Italian regions (as it was determined by “historical accidents”) and therefore is uncorrelated with the residuals of the main equation where economic performance is the dependent variable. Guiso *et al.* find a good fit when they regress the indicator of regional financial development on the set of instruments. Finally the authors find a positive and significant relationship between economic performance and the instrumented indicator of regional financial development.

Second, also Herrera and Minetti (2007) follow the approach of Guiso *et al.* (2004a). Using our same survey, they find that the information of the firm’s main bank, approximated by the duration of credit relationship, promotes technological innovation. But the duration of credit relationship might not be exogenous with respect to product and process innovation. Therefore in order to find some instruments they try to identify shocks to the local supply of banking services. The idea is that these shocks influence “firms’ decisions to continue with their main banks and banks’ decisions to continue with their customary borrowers and, hence the duration of credit relationships” (Herrera and Minetti 2007, page 236). Therefore they regress the duration of credit relationship on some provincial variables that have affected the local supply of banking services: two variables are taken from the Guiso *et al.* (2004a) framework (saving banks and cooperative banks in 1936); other two variables consider the average number of branches created by incumbents and, respectively, by entrants in the provinces in the first years of branch liberalization (1991-1998). Finally the authors find a positive relationship between technological innovation and the instrumented length of the credit relationship.

The instruments considered here are similar to those used by Herrera and Minetti (2007) and Ferri, Minetti and Rotondi (2007). Our main independent variable is the length of the relationship between the firm and the main bank. We instrument this variable using indicators that describe the banking markets in 1936 and refer to shocks to the local supply of banking services in the Nineties. In particular, we have a variable describing the banking market in 1936, when a restrictive regulation was introduced: the number of saving banks per 10,000 citizens in each region. Moreover, we have

two variables describing the structure of local banking markets during the period 1991-1998, when the Italian banking sector was deregulated and became more concentrated: the total number of branches and the number of branches opened by new entrants in each province per 1,000 citizens.

To ensure the validity of the chosen instruments we perform diagnostic checks. A good instrument must be correlated with the endogenous variable and orthogonal to the error term. We have tested the assumption of correlation with an F-test of the excluded instruments. As it is possible to see from Table 3, where we showed the first-stage regression, the null hypothesis of excluded instruments is rejected with a 1 percent confidence level. As the estimated equation is reported with heteroskedastic-robust standard errors, the first-stage F-test for the excluded instruments is also heteroskedastic-robust.³ In turn, the assumption of orthogonality to the error term is tested using the Hansen-Sargan overidentification test. In the tables we report the *p*-value of the J-statistic. A rejection of the Hansen-Sargan overidentification test can be interpreted as either having invalid instruments and/or incorrect model specification.

An important limit of the analysis thus far described is that IV estimation implicitly assumes a linear probability model for the firm's choice to go international. For this reason, consistently with Ferri, Minetti and Rotondi (2007), we have considered also an IV-Probit estimation, following the methodology of Wooldridge (2002). In fact, this methodology does not require the assumption of a linear probability model and uses maximum conditional likelihood to estimate a Probit model with an endogenous explanatory variable. A test on the exogeneity of the instrumented variable is also shown in these tables, with the test statistic distributed as a chi-squared.

Tables 4-8 show the results of the Probit, IV and IV-Probit estimations, along with the robust standard errors aside each estimated coefficient. We estimate regressions on the pooled firm level data covering the 1998-2003 period.

Table 4 examines the determinants of FDIs. Given the aim of the current analysis to explore the interaction between the choice of going international and the intensity of the bank-firm relationship, our main interest is to explain the estimates obtained for the length of the bank-firm link. Column 1 shows the Probit estimates. As we can see, the impact of the length of the bank-firm relationship is statistically significant (at the 5% confidence level). Column 3 shows the IV estimates. The length of the bank-firm relationship is still significant, although the level of confidence is

³ We have tested the assumption of correlation also 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. Similarly to the standard F-test reported in Table 3, the null hypothesis of excluded instruments is again rejected with a 1 percent confidence level.

reduced to 10%. The J -statistic has a p-value of .34 and hence the overidentification test does not reject the joint null hypothesis that the chosen instruments are valid. Column 5 shows the IV-Probit estimates: the exogeneity test rejects the null hypothesis that the instrumented regressor can be treated as an exogenous variable in the estimation. In this new estimation, the impact of the length of the relationship on the probability that the firm undertakes FDI is highly statistically significant (at the 1% confidence level) and is economically relevant (the marginal effect on the mean value is equal to 0.31).

A further robustness check entails interacting the length of the bank-firm relationship with a measure of bank internationalization. It is likely that the impact of the bank-firm informational tightness on the firm's internationalization is even more pronounced when the firm's main bank goes international. In Table 5 we examine the interaction of the duration of bank-firm relationship with the internationalization of the firm's main bank. Here, given the findings reported in Table 4, we consider only the IV-Probit estimation. Firstly we interact the duration with the occurrence that the main bank has branches and/or subsidiaries abroad; subsequently we consider separately the cases when the main bank has branches or subsidiaries abroad. We find some empirical support to the idea that having an internationalized main bank strengthens the importance of informational tightness for becoming an internationalized firm. The most significant impact is when the duration interacts with the main bank having subsidiaries abroad (Column 5).

In Table 6, the factors determining off-shoring are examined. As we can see, in the Probit estimates (Column 1) the impact of the length of the bank-firm relationship is statistically significant, at the 5% confidence level. Column 3 shows the IV estimates. As it is possible to see the length of the bank-firm relationship is not significant. The J -statistic has a p-value of .67 and hence the overidentification test does not reject the joint null hypothesis that the instruments are valid. Column 5 shows the IV-Probit estimates and in this new estimation the impact of the duration of the relationship on the probability that the firm delocalizes is not statistically significant. However, the exogeneity test does not reject the null hypothesis that the instrumented regressor can be treated as an exogenous variable in the estimation.

In Table 7 we examine the interaction of the duration of bank-firm relationship with the internationalization of the firm's main bank. Here, given the findings reported in Table 6, we consider only the Probit estimation. Although in a lesser extent compared to the case of FDI, we find again some empirical support to the idea that having an internationalized main bank strengthens the importance of informational tightness for becoming an internationalized firm. As it is possible to in

the Table, the only significant impact (at a 10% confidence level) is in Column 3 when the duration interacts with the main bank having branches abroad.

Finally, the factors determining the decision to export are examined in Table 8. As we can see, in this case the length of the bank-firm relationship is not significant in either the Probit estimation (Column 1) or IV and IV-Probit estimations (Columns 3 and 5).

To check the robustness of our results we also used as independent variable the number of banks granting loans to the enterprise, in order to capture multi-banking relationships. The previous empirical evidence was not affected by the consideration of this new regressor (results are available upon request).

5. Conclusion

Using data on Italian firms, this paper addressed the factors behind the various forms of enterprise internationalization focusing on the role played by the length of the relationship between the firm and its main bank. Our empirical results show that foreign direct investments and, more weakly, international off-shoring of production are both positively affected by the length of that relationship. Since these forms of internationalization tend to make firms more opaque, a situation in which a strong relationship between the bank and the firm may prove extremely beneficial for overcoming informational asymmetries. On the contrary, bank relationships do not seem to influence the firm's decision to export, indicating that this form of internationalization is perhaps so simple that a firm may undertake it even without the support of its main bank.

What's more, the positive impact of longer bank-firm relationships on the probability that the firm will internationalize becomes even more prominent when the main bank is itself internationalized. In this respect, we showed that this additional benefit accrues to FDI firms when their main bank holds foreign subsidiaries while it accrues to firms off-shoring production abroad when their main bank has foreign branches.

We obtained these results considering a wide range of control variables: they are also robust even when we introduce the number of banks lending to the firm as an independent variable, a further proxy of the intensity of the bank-firm relationship.

Thus, our evidence suggests that the internationalization of production by manufacturing firms is favored by the existence of strong bank-firm relationships. Considering that the internationalization of production is a key step in increasing the growth of firms or even a leap

frogging in firm size, the intensity of the bank-firm relationships seems to be a strategic feature. The fundamental channel through which this impact is felt is by relaxing the barriers to the growth choices of the firm, especially when these choices lead to an increase in the opaqueness of the firm's activities such as shifting (some) production abroad.

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Table 1 – Variables: definition and source

	Definition	Source
Relationship length	Log of the number of years of the relationship between the firm and its main bank	Capitalia Survey
Banks	Log of the number of banks with which the firm entertains credit relationships	Capitalia Survey
Branches (instrumental variable)	Average number of branches per 1,000 citizens in the province during the 1991-1998 period	Herrera-Minetti (2007)
HHI	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
ROI	Return on investment	AIDA
Innovative financial instruments	Dummy that takes the value 1 if the firm uses innovative financial instruments; 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
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
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
Value added	Per capita value added in the province in 1991	ISTAT
Saving banks in 1936 (instrumental variable)	Number of saving banks per 10,000 citizens in the region in 1936	Guiso <i>et al.</i> , 2004a
New branches entrants (instrumental variable)	Average number of new branches created by entrants per 1,000 citizens in the province during the 1991-1998 period	Herrera-Minetti (2007)

Table 1 – Variables: definition and source (continued)

	Definition	Source
Offshoring	Dummy that takes the value 1 if the firm has offshored abroad part of the (or the whole) production; 0 otherwise	Capitalia Survey
FDI	Dummy that takes the value 1 if the firm has made FDI; 0 otherwise	Capitalia Survey
Export	Dummy that takes the value 1 if the firm has exported products abroad; 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
Internationalized bank	Dummy that takes the value 1 if the main bank of the firm has branches and/or subsidiaries abroad; 0 otherwise	Bank of Italy
Bank with branches abroad	Dummy that takes the value 1 if the main bank of the firm has branches abroad; 0 otherwise	Bank of Italy
Bank with subsidiaries abroad	Dummy that takes the value 1 if the main bank of the firm has subsidiaries abroad; 0 otherwise	Bank of Italy
Independent joint-stock bank	Dummy that takes the value 1 if the main bank of the firm is an independent joint-stock bank; 0 otherwise	Bank of Italy
Popular cooperative bank	Dummy that takes the value 1 if the main bank of the firm is a popular cooperative bank; 0 otherwise	Bank of Italy
Credit cooperative bank	Dummy that takes the value 1 if the main bank of the firm is a credit cooperative bank; 0 otherwise	Bank of Italy
Located in an industrial district and same industry of the district	Dummy that takes the value 1 if the firm is located in an industrial district and belongs to the same industry of the district; 0 otherwise	Capitalia Survey
Located in an industrial district	Dummy that takes the value 1 if the firm is located in an industrial district but not necessarily belongs to the same industry of the district; 0 otherwise	Capitalia Survey
Located in an industrial district of the made-in-Italy	Dummy that takes the value 1 if the firm is located in an industrial district of the made-in-Italy but not necessarily belongs to the same industry of the district; 0 otherwise	Capitalia Survey

Table 2 – Summary statistics

	Median	Mean	1st Percentile	99th Percentile	Standard Deviation
Relationship length (log)	2.773	2.684	1.099	4.025	0.683
Banks	1.609	1.512	0	2.996	0.613
Branches (instrumental variable)	0.473	0.460	0.202	0.795	0.118
HHI	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
ROI	9.940	10.394	-14.089	28.315	8.624
Innovative financial instruments	0	0.043	0	1	0.203
Credit consortium	0	0.030	0	1	0.170
Export consortium	0	0.017	0	1	0.130
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
Social capital	0.86	0.840	0.660	0.910	0.062
Value added	2.663	2.613	1.997	3.000	0.235
Saving banks in 1936 (instrumental variable)	0.032	0.029	0	0.102	0.027
New branches entrants (instrumental variable)	0.002	0.003	0	0.009	0.002
Offshoring	0	0.047	0	1	0.212
FDI	0	0.027	0	1	0.163
Export	1	0.709	0	1	0.454
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
Internationalized bank	0	0.473	0	1	0.499
Bank with branches abroad	0	0.414	0	1	0.493
Bank with subsidiaries abroad	0	0.325	0	1	0.468
Independent joint-stock bank	1	0.772	0	1	0.419
Popular cooperative bank	0	0.175	0	1	0.380
Credit cooperative bank	0	0.047	0	1	0.211
Located in an industrial district and same industry of the district	0	0.135	0	1	0.342
Located in an industrial district	0	0.480	0	1	0.500
Located in an industrial district of the made-in-Italy	0	0.307	0	1	0.461

Table 3 – Determinants of the duration of the bank-firm relationship

	OLS	
	Coeff.	S.E.
New branches entrants	-13.5026**	5.3665
Saving banks in 1936	-0.0789	0.3191
Branches	-0.3214***	0.1072
HHI	0.8141**	0.3590
Leverage	0.0227	0.0726
Total assets	-0.0317	0.0200
ROE	-0.0002	0.0006
ROI	0.0013	0.0012
Innovative financial instruments	-0.0414	0.0392
Credit consortium	-0.0434	0.0485
Export consortium	0.0942*	0.0568
Corporation	-0.0361	0.0428
Group	-0.1288***	0.0214
Age	0.5061***	0.0127
International competitors	-0.0303*	0.0176
ISO9000 certified	0.0032	0.0180
Value added	0.0230	0.0630
Social capital	0.8563***	0.3095
South	-0.0219	0.0464
Independent joint-stock bank	-0.0049	0.0212
Credit cooperative bank	0.0173	0.0386
Located in an industrial district and same industry of the district	-0.0039	0.0300
Located in an industrial district	0.0384	0.0256
Located in an industrial district of the made-in-Italy	0.0021	0.0250
<i>Observations</i>	5736	
<i>R²</i>	0.260	
<i>Wald test of excluded instruments, F-statistic</i>	6.680***	

Notes: Pooled regressions using the last two waves of the Capitalia survey (1998-2000 and 2001-2003). The endogenous variable is the log of the number of years of the relationship between the firm and its main bank. For the definition of the regressors see Table 2. See the section on the methodology for the definition of the test statistics reported in the table. The regression includes 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.

Table 4 – Determinants of FDIs

	Probit		IV		IV-Probit	
	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
Relationship length	0.1225**	0.0608	0.1129*	0.0633	1.5035***	0.1940
HHI	-1.3121	1.9340	-0.1943*	0.1041	-2.2787*	1.2159
Leverage	0.4340	0.3474	0.0343	0.0219	0.2138	0.2399
Total assets	0.3943***	0.0736	0.0352***	0.0069	0.2636***	0.0890
ROE	0.0057*	0.0030	0.0003	0.0002	0.0038*	0.0022
ROI	-0.0087*	0.0053	-0.0004	0.0003	-0.0065*	0.0036
Innov. financial instruments	0.2289	0.1416	0.0238	0.0148	0.1809*	0.0992
Credit consortium	0.2252	0.1771	0.0186	0.0162	0.2051	0.1300
Export consortium	0.0036	0.2464	-0.0063	0.0168	-0.1318	0.1511
Corporation	-0.4167**	0.1927	-0.0135	0.0130	-0.1722	0.1473
Group	0.3952***	0.0891	0.0446***	0.0108	0.3887***	0.0786
Age	-0.0395	0.0630	-0.0550*	0.0325	-0.7544***	0.1085
International competitors	0.3498***	0.0761	0.0254***	0.0058	0.2252***	0.0795
ISO9000 certified	-0.0128	0.0841	-0.0011	0.0050	-0.0060	0.0522
Value added	-0.4061	0.3018	-0.0280	0.0181	-0.2980	0.2053
Social capital	-2.5672*	1.3348	-0.1851**	0.0852	-2.0186**	0.9049
South	-0.7063***	0.2511	-0.0371***	0.0138	-0.3712*	0.2035
Independent joint-stock bank	0.0240	0.0948	0.0047	0.0063	0.0276	0.0598
Credit cooperative bank	0.0464	0.2069	0.0029	0.0103	-0.0142	0.1323
Located in an industrial district and same industry of the district	0.0128	0.1247	0.0027	0.0102	0.0152	0.0816
Located in an industrial district	0.0789	0.1172	-0.0013	0.0082	-0.0131	0.0783
Located in an industrial district of the made-in-Italy	-0.0232	0.1115	-0.0005	0.0076	-0.0108	0.0710
<i>Observations</i>	5516		5689		5513	
<i>F-test</i>			2.700***			
<i>Wald test, χ^2-statistic</i>	198.510***				1268.530***	
<i>Exogeneity test, χ^2-statistic</i>					7.660***	
<i>Overidentification test, Hansen J-statistic (p-value)</i>			0.341			

Notes: Pooled regressions using the last two waves of the Capitalia survey (1998-2000 and 2001-2003). The endogenous variable is a dummy that takes the value 1 if the firm has made FDI; 0 otherwise. IV and IV-Probit estimations use as instruments a set of variables that describe the banking market as of 1936 (see Guiso *et al.*, 2004a) and a set of variables that describe shocks to the local supply of banking services for the 1991-1998 period (see Herrera and Minetti 2007). For the definition of the regressors see Table 2. See the section on the methodology for the definition of the test statistics reported in the table. The 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.

Table 5 – Determinants of FDIs: interaction of duration with internationalization of main bank

	IV-Probit		IV-Probit		IV-Probit	
	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
Relationship length × internationalized bank	0.4724**	0.1978				
Relationship length × bank with branches abroad			0.3383	0.2169		
Relationship length × bank with subsidiaries abroad					0.5029***	0.1844
HHI	-2.3665	1.5999	-1.7848	1.7916	-2.2930	1.6916
Leverage	0.4254	0.2892	0.4935	0.3160	0.4265	0.2986
Total assets	0.2500**	0.1247	0.3075***	0.1112	0.2820***	0.1009
ROE	0.0045*	0.0027	0.0056**	0.0027	0.0055**	0.0026
ROI	-0.0057	0.0049	-0.0071	0.0051	-0.0083*	0.0046
Innov. financial instruments	0.1558	0.1311	0.1989	0.1364	0.1752	0.1269
Credit consortium	0.1834	0.1537	0.1714	0.1689	0.2263	0.1521
Export consortium	0.0880	0.2026	0.0322	0.2230	0.0125	0.2061
Corporation	-0.4675***	0.1587	-0.4528**	0.1748	-0.4392***	0.1628
Group	0.2990***	0.1050	0.3486***	0.0931	0.3094***	0.0961
Age	-0.0891	0.0662	-0.0544	0.0709	-0.0690	0.0581
International competitors	0.2623***	0.0979	0.3125***	0.0857	0.2809***	0.0853
ISO9000 certified	-0.0333	0.0691	-0.0478	0.0785	-0.0276	0.0714
Value added	-0.5331**	0.2521	-0.4314	0.2883	-0.3185	0.2821
Social capital	-1.3792	1.3205	-1.0887	1.6180	-1.5660	1.2672
South	-0.6156**	0.2422	-0.5562**	0.2831	-0.5248**	0.2536
Independent joint-stock bank	0.5278**	0.2261	0.2149	0.1514	0.7004***	0.2631
Credit cooperative bank	0.9384**	0.4604	0.4656	0.3937	0.9292**	0.4132
Located in an industrial district and same industry of the district	0.0663	0.1061	0.0340	0.1157	0.0545	0.1085
Located in an industrial district	-0.0079	0.1107	0.0568	0.1119	0.0463	0.1038
Located in an industrial district of the made-in-Italy	0.0736	0.1036	0.0276	0.1090	-0.0018	0.0964
<i>Observations</i>	5513		5513		5513	
<i>Wald test, χ^2-statistic</i>	424.000***		285.980***		375.060***	
<i>Exogeneity test, χ^2-statistic</i>	2.900		1.600		3.800**	

Notes: Pooled regressions using the last two waves of the Capitalia survey (1998-2000 and 2001-2003). The endogenous variable is a dummy that takes the value 1 if the firm has made FDI; 0 otherwise. IV-Probit estimation uses as instruments a set of variables that describe the banking market as of 1936 (see Guiso *et al.*, 2004a) and a set of variables that describe shocks to the local supply of banking services for the 1991-1998 period (see Herrera and Minetti 2007). For the definition of the regressors see Table 2. See the section on the methodology for the definition of the test statistics reported in the table. The 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.

Table 6 – Determinants of offshoring

	Probit		IV		IV-Probit	
	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
Relationship length	0.1020**	0.0516	-0.0738	0.0882	-0.5880	0.9051
HHI	0.6093	1.7849	0.1691	0.1422	1.1851	1.7467
Leverage	0.8162**	0.3186	0.0757***	0.0247	0.7532**	0.3483
Total assets	0.5412***	0.0706	0.0545***	0.0084	0.4732***	0.1644
ROE	0.0026	0.0025	0.0001	0.0002	0.0021	0.0025
ROI	-0.0078	0.0049	-0.0003	0.0004	-0.0062	0.0053
Innov. financial instruments	0.1689	0.1374	0.0103	0.0169	0.1208	0.1486
Credit consortium	0.4396***	0.1462	0.0370*	0.0215	0.3774**	0.1902
Export consortium	-0.3950	0.2823	-0.0239	0.0191	-0.2986	0.3118
Corporation	-0.1323	0.2090	-0.0067	0.0128	-0.1466	0.1933
Group	0.3452***	0.0772	0.0282**	0.0140	0.2264	0.2038
Age	-0.0806	0.0558	0.0383	0.0451	0.2723	0.4672
International competitors	0.3461***	0.0688	0.0272***	0.0075	0.2973**	0.1236
ISO9000 certified	0.0210	0.0772	-0.0008	0.0061	0.0215	0.0719
Value added	-0.1166	0.2736	-0.0103	0.0225	-0.0783	0.2574
Social capital	2.2203*	1.1791	0.2337**	0.1050	2.2933**	1.0969
South	-0.0492	0.2102	-0.0026	0.0166	-0.0556	0.1951
Independent joint-stock bank	-0.0426	0.0812	-0.0033	0.0079	-0.0461	0.0755
Credit cooperative bank	0.0091	0.1891	0.0076	0.0132	0.0094	0.1780
Located in an industrial district and same industry of the district	-0.0078	0.1088	-0.0080	0.0134	-0.0041	0.1015
Located in an industrial district	-0.0371	0.1038	0.0009	0.0100	-0.0009	0.1098
Located in an industrial district of the made-in-Italy	0.0022	0.1014	-0.0026	0.0091	-0.0062	0.0948
<i>Observations</i>	5681		5706		5678	
<i>F-test</i>			6.480***			
<i>Wald test, χ^2-statistic</i>	337.500***				410.250***	
<i>Exogeneity test, χ^2-statistic</i>					0.470	
<i>Overidentification test, Hansen J-statistic (p-value)</i>			0.674			

Notes: Pooled regressions using the last two waves of the Capitalia survey (1998-2000 and 2001-2003). The endogenous variable is a dummy that takes the value 1 if the firm has offshored abroad part of the (or the whole) production; 0 otherwise. IV and IV-Probit estimations use as instruments a set of variables that describe the banking market as of 1936 (see Guiso *et al.*, 2004a) and a set of variables that describe shocks to the local supply of banking services for the 1991-1998 period (see Herrera and Minetti 2007). For the definition of the regressors see Table 2. See the section on the methodology for the definition of the test statistics reported in the table. The 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.

Table 7 – Determinants of offshoring: interaction of duration with internationalization of main bank

	Probit		Probit		Probit	
	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
Relationship length × internationalized bank	0.0352	0.0235				
Relationship length × bank with branches abroad			0.0395*	0.0230		
Relationship length × bank with subsidiaries abroad					0.0251	0.0250
HHI	0.6482	1.7982	0.7060	1.7958	0.6174	1.7986
Leverage	0.8210**	0.3195	0.8272**	0.3203	0.8176**	0.3184
Total assets	0.5289***	0.0700	0.5284***	0.0701	0.5335***	0.0701
ROE	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025
ROI	-0.0073	0.0049	-0.0073	0.0048	-0.0075	0.0049
Innov. financial instruments	0.1610	0.1372	0.1618	0.1376	0.1626	0.1368
Credit consortium	0.4263***	0.1463	0.4213***	0.1464	0.4284***	0.1462
Export consortium	-0.3835	0.2804	-0.3903	0.2795	-0.3823	0.2810
Corporation	-0.1274	0.2094	-0.1238	0.2095	-0.1256	0.2083
Group	0.3341***	0.0769	0.3353***	0.0770	0.3318***	0.0767
Age	-0.0371	0.0505	-0.0376	0.0504	-0.0329	0.0502
International competitors	0.3440***	0.0689	0.3452***	0.0689	0.3432***	0.0690
ISO9000 certified	0.0180	0.0772	0.0166	0.0773	0.0198	0.0772
Value added	-0.1275	0.2754	-0.1139	0.2750	-0.1142	0.2744
Social capital	2.2589*	1.1785	2.3346**	1.1785	2.3061*	1.1831
South	-0.0580	0.2117	-0.0445	0.2114	-0.0429	0.2110
Independent joint-stock bank	-0.0075	0.0827	-0.0241	0.0806	-0.0089	0.0859
Credit cooperative bank	0.0858	0.1942	0.0713	0.1912	0.0630	0.1943
Located in an industrial district and same industry of the district	-0.0015	0.1084	-0.0017	0.1084	-0.0042	0.1084
Located in an industrial district	-0.0324	0.1036	-0.0298	0.1036	-0.0275	0.1035
Located in an industrial district of the made-in-Italy	0.0040	0.1010	0.0054	0.1008	-0.0028	0.1010
<i>Observations</i>	5681		5681		5681	
<i>Wald test, χ^2-statistic</i>	332.520***		334.290***		333.070***	

Notes: Pooled regressions using the last two waves of the Capitalia survey (1998-2000 and 2001-2003). The endogenous variable is a dummy that takes the value 1 if the firm has offshored abroad part of the (or the whole) production; 0 otherwise. For the definition of the regressors see Table 2. See the section on the methodology for the definition of the test statistics reported in the table. The 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.

Table 8 – Determinants of exports

	Probit		IV		IV-Probit	
	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
Relationship length	0.0098	0.0347	-0.0055	0.1754	0.0670	0.6458
HHI	-1.7269**	0.8632	-0.5758*	0.2990	-1.8011*	1.0247
Leverage	-0.2003	0.1811	-0.0318	0.0470	-0.1957	0.1814
Total assets	0.7773***	0.0584	0.1875***	0.0136	0.7819***	0.0592
ROE	-0.0004	0.0015	-0.0001	0.0004	-0.0004	0.0015
ROI	0.0049*	0.0029	0.0011	0.0008	0.0048	0.0030
Innov. financial instruments	0.0578	0.1012	0.0138	0.0252	0.0596	0.1052
Credit consortium	0.2374**	0.1171	0.0602**	0.0275	0.2391**	0.1182
Export consortium	0.9124***	0.2090	0.1821***	0.0338	0.9071***	0.2208
Corporation	0.5653***	0.0929	0.1705***	0.0315	0.5670***	0.0942
Group	-0.1689***	0.0547	-0.0531**	0.0261	-0.1636	0.1011
Age	0.0295	0.0380	0.0099	0.0895	-0.0017	0.3296
International competitors	0.9398***	0.0509	0.2200***	0.0120	0.9405***	0.0516
ISO9000 certified	0.1344***	0.0449	0.0366***	0.0121	0.1341***	0.0450
Value added	0.0490	0.1532	0.0080	0.0407	0.0426	0.1542
Social capital	0.1481	0.6945	0.0398	0.2112	0.1456	0.7604
South	-0.2689**	0.1200	-0.0731**	0.0340	-0.2645	0.1204
Independent joint-stock bank	0.0026	0.0534	-0.0042	0.0138	0.0035	0.0539
Credit cooperative bank	-0.0227	0.1004	-0.0107	0.0300	-0.0230	0.1005
Located in an industrial district and same industry of the district	-0.1192	0.0821	-0.0235	0.0180	-0.1181	0.0822
Located in an industrial district	0.1026	0.0629	0.0319*	0.0181	0.0987	0.0692
Located in an industrial district of the made-in-Italy	0.0057	0.0628	0.0010	0.0159	0.0066	0.0630
<i>Observations</i>	5701		5698		5698	
<i>F-test</i>			49.490***			
<i>Wald test, χ^2-statistic</i>	1075.870***				1076.020***	
<i>Exogeneity test, χ^2-statistic</i>					0.010	
<i>Overidentification test, Hansen J-statistic (p-value)</i>			0.772			

Notes: Pooled regressions using the last two waves of the Capitalia survey (1998-2000 and 2001-2003). The endogenous variable is a dummy that takes the value 1 if the firm has exported products abroad; 0 otherwise. IV and IV-Probit estimations use as instruments a set of variables that describe the banking market as of 1936 (see Guiso *et al.*, 2004a) and a set of variables that describe shocks to the local supply of banking services for the 1991-1998 period (see Herrera and Minetti 2007). For the definition of the regressors see Table 2. See the section on the methodology for the definition of the test statistics reported in the table. The 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.