

CEIS Tor Vergata

RESEARCH PAPER SERIES

Vol. 6, Issue 9, No. 131 – October 2008

Do Collateral Theories Work in Social Banking?

Leonardo Becchetti and Melody Garcia

This paper can be downloaded without charge from the
Social Science Research Network Electronic Paper Collection
http://papers.ssrn.com/paper.taf?abstract_id=1297207

Electronic copy available at: <http://ssrn.com/abstract=1297207>

Do collateral theories work in social banking ?

Leonardo Becchetti
University of Rome Tor Vergata

Melody Garcia
University of Rome Tor Vergata

We study the determinants of collateralisation on the universe of credit files of non individual borrowers in a “Grameen’s type” Bank (Banca Popolare Etica) which aims to reconcile economic sustainability with the pursuit of social goals.

The extremely high share of uncollateralized loans (around 42 percent) appears consistent with a multistakeholder (customer oriented) approach which internalises the welfare costs of default of collateralised borrowers. Econometric findings document that collateralisation depends positively on ex ante borrower’s risk (proxied by non performing past track record) and, negatively, on relationship lending. The incentive effect seems to work since collateralised borrowers are ex ante, but not ex post, riskier.

Keywords: collateral, bank-firm relationship, credit risk.

JEL Numbers: G21.

1. Introduction

Descriptive evidence on banking practices in industrialised countries shows that the vast majority of loans are collateralised.¹ This is the case for 86 percent of loans to small firms in the US (Federal Reserve Bulletin 2004) and 85 percent of small business loans in the UK (Coco 2000; Black, de Meza and Jeffreys, 1996).

On the one hand, collateralisation is neither costless for banks (legal and monitoring costs, costs of collection and marketing of the collateralised asset in case of borrower default), nor for the society (welfare costs when the borrower’s evaluation of the collateral is higher than the collateral market value) (Chan-Kanatas, 1985; Barro, 1976). On the other hand, several contributions in the theoretical and empirical literature document that it may provide several benefits for the lender. Trivially, collateral seizure reduces or eliminates costs from lending to insolvent borrowers.

¹ For collateral we mean here *outside collateral*, that is, an asset external to the project which can be appropriated by the lender in case of borrower’s default.

Conventional wisdom also suggests that the collateral generates positive incentive effects on the borrower in the financing period (Watson, 1984; Clemenz, 1986; Boot and Thakor, 1994). Such incentives contribute to solve problems of hidden action and reduce lender's monitoring costs. In addition to it, collateral provision may mitigate strategic default problems in presence of asymmetric information and ex post costly state verification (Bester, 1994). Finally, the collateral is also an important screening device which helps to identify borrowers' characteristics (risk and profitability) before they receive credit (Bester 1985 and 1987; Clemenz, 1986).

In our paper we aim to fill a gap in this literature by looking at the "anomalous behaviour" in collateralisation policies of a specific and almost unexplored segment of financial intermediaries: "ethical"² or social banks (banks whose main goal is to finance projects of high social and environmental value). Ethical and social banks are a new interesting feature of market economies. The most important of them is the Grameen Bank (the founder of modern microfinance) which started from nothing a decade ago to become a very large bank (400,000 employees and more than 3 million customers) funding an industry which counts 3,316 lending institutions lending to around 133 million borrowers according to the 2006 data of the *Microcredit Summit Campaign*.

The main feature of ethical or social banks is their ranking of priorities in which social goals come before profit ones. The Grameen's bank founder Junus defines himself a social entrepreneur and declares that the specific Grameen's goal is that of promoting equal opportunities by allowing access to credit to the "unbankables".

² The "ethical" adjective does not imply lack of recognition of the "social" roles of traditional banks in the economic system (pooling savings, providing liquidity services and allocating financial resources to profitable destinations). It just identifies a specific group of banks whose goal is that of easing access to credit to enterprises with social goals or to poor borrowers lacking of collateral resources.

The object of our empirical analysis is an Italian social and ethical bank (Banca Etica) which shares with Grameen the priority for social over profit goals.³ Banca Etica's declared goal is that of maximising the social value of the financed projects after satisfying the feasibility constraint (ie., no losses and moderate profits which may be transformed into reserves to increase bank capitalisation).⁴ To realise its social goal Banca Etica is mainly (but not uniquely) dedicated to finance projects of not for profit corporations (cooperatives, associations, etc.) working in different industries (health, education, recreation, etc.) and of individual borrowers (housing, energy production with renewable sources, microfinance, etc.). Given its specific goal (which is also "declared" in its name⁵) Banca Etica enjoys an "ethical premium" from investors who demonstrated themselves to be willing to finance her at below the market rate.⁶ For this reason the reassessment of the bank stand alone value with the passage from book value to the IAS market value accounting

³ The most well known "ethical and environmental banks" similar to Banca Etica in Europe at end 2006 were Triodos Bank (124 million euros of equity capital, 1.36 billion euros of savings), GLS Gemeinschaftsbank (35.5 million euros of equity capital and 567.8 million euros of savings) and Umwelbank (5.1 million euros of equity capital and 515.8 million euros of savings). The relative success of such banks is inducing also big European players to create similar initiatives. In 2007 Intesa-San Paolo, the second largest Italian bank, created Banca Prossima with characteristics which are very similar to those of Banca Etica.

⁴ The Company declares to adopt the following principles of Ethical Finance: i) ethically oriented finance is aware of non economic consequences of economic actions; ii) access to finance, in all its forms, is a human right; iii) efficiency and soberness are components of ethical responsibility; iv) profit produced by the ownership and exchange of money must come from activities oriented towards common well-being and shall have to be equally distributed among all subjects which contribute to its realisation; v) maximum transparency of all operations is one of the main conditions of all ethical finance activities; vi) the active involvement of shareholders and savers in the company's decision making process must be encouraged; vii) each organisation which accepts and adheres to the principles of ethical finance undertakes to inspire its entire activity to such principles.

⁵ Using the adjective "ethical" in the brand name is a strong commitment which raises "ethically concerned" shareholders and customers expectations and poses a hard challenge to the Bank. This decision has aroused some criticism. Banca Etica management has denied that the use of this adjective implied that the rest of the banking system was considered non ethical, explaining that it wanted to emphasize that social welfare and human wellbeing was the direct main goal of its activity.

⁶ On average, since its start the ethical premium (difference between the average interest rate paid to customers by Banca Etica and the Italian banking system) to the bank was around 150 basis points in 2007.

led, at end 2007, to extraordinary profits. After 9 years or life the bank has now (at February 2008) more than 28,000 shareholders, around 600 million euros of savings and 374 million of loans.

In the light of these considerations, the goal of our paper is to examine whether factors explaining collateralisation for Banca Etica may be related to the traditional interpretation provided by the literature and whether the decision not to ask collateral has effects on borrower's ex post performance.

More specifically, with regard to variables affecting collateralisation, the paper will explore the role of proxies of relationship banking, borrower's risk and multiple borrowing, in addition to that of standard controls such as credit type and purpose of action, borrower's industry and localisation.

Consider as well that, beyond the specific characteristics of the bank, our empirical work is one of the few focusing on the collateralisation decision using credit file data directly provided from the bank with ample and detailed information on borrower and credit characteristics.

The paper is divided into six sections (introduction and conclusions included). In section two we describe characteristics of our financial intermediary. In section three we outline theoretical framework which is used as a benchmark for our empirical analysis. In section four we present the econometric approach followed in our analysis. In section five we comment empirical findings relating them to the literature debate. In section six we investigate the role of collateralisation on ex post bad credit performance. Section seven concludes.

2. Banca Etica, the database and descriptive findings

Our dataset is the universe of credit files of non individual borrowers⁷ by Banca Etica (a recently born *Banca Popolare*⁸) from its year of foundation (1999) to July 2006. Available data include

⁷ Actually our database includes all loans from non individual borrowers plus loans from those individual borrowers who manage organisations which borrowed from the bank.

⁸ *Banche Popolari* share with *Banche cooperative* the characteristic of adopting the one share-one vote rule. However, differently from the latter, they have not a profit distribution constraint and they

information on credit positions⁹ and borrower's characteristics from official bank records and from its screening procedures. To this information we add data on relevant macroeconomic and financial variables taken from ISTAT (Italian national statistical institute), OECD or Bank of Italy.¹⁰ Definitions of selected variables and their summary statistics are provided in Tables 1 and 2.

A first piece of evidence is that a remarkable share of credit positions (41.9 percent) is uncollateralized, a percent which is far higher than the average in commercial banks (see introduction). The large majority of collateralised credit positions (52.73 percent) have personal collateral only. The remaining is real collateral (3.17 percent), consortium collateral (1.49 percent), real plus personal collateral (0.69 percent) and, consortium plus personal collateral (0.69 percent).

To interpret these numbers consider that, in case of default, collateralisation entails an additional welfare cost determined by the positive difference between the borrower and the bank (market) value of the collateral (Chan-Kanatas, 1985, Barro, 1976; Coco, 2000). As a consequence, we may believe that a lender with a multistakeholder (and customer oriented) approach may internalize this welfare cost and be less inclined to pledge collateral than a traditional commercial bank. A second main rationale for this finding is that most borrowers are part of second level organisations (*consorzi*). The long run relationship between *consorzi* and the bank may generate an implicit commitment of the former to intervene in case of financial distress of one of its members, even though *consorzi* do not provide any formal guarantee on the borrower. In a sense, this mechanism

can operate at national (and not only regional) level. In recent times *Banche Popolari* became hardly distinguishable from traditional banks (especially larger ones who went public) and have been criticised on the grounds that the one share/one vote rule acts as an antitakeover barrier and is no more justified by the pursuit of a specific social goal.

⁹ Throughout all the paper we will use the term credit position to indicate generically our observation unit since our database includes both credit lines and cosigning agreements (see footnote 19) which cannot be assimilated to standard loans.

¹⁰ Unfortunately, information on balance sheet values of borrowers is scant and, most of times, of very scarce relevance (consider that most of borrowers are not for profit entities and/or associations with or without juridical status with very weak accounting obligations which prevent the lender from collecting reliable balance sheet information). We therefore omit these variables from our estimates.

is a special case of relationship lending which provides to Banca Etica advantages of secured loans without paying the cost of pledging collateral.

Another interesting information we extract from descriptive findings is that, out of 1,009 observations, the credit position authorized by the bank Board is positive but below the amount requested by the borrower (partial credit rationing) in 20.42 percent of cases, while it is denied altogether (total credit rationing) in 15.46 percent of cases.

As expected the activity of the bank grows progressively as far as we depart from the foundation year (57.5 percent of credit positions are opened after 2002). With regard to credit performance *sofferenze*¹¹ are only 0.14 percent of total loans (11 cases) and *incagli*¹² account for an additional 1.4 percent of total loans.¹³ Even though this result may be affected by the fact that many of the loans are still outstanding, it is however remarkable given the relatively higher share of Banca Etica's uncollateralized loans. Consider that the average share of non performing loans (*incagli* or *sofferenze*) in the Italian banking system is around 4 percent in the sample period.

As mentioned before, a main peculiarity of Banca Etica is related to the nature of borrowers. 43.6 percent of them are cooperatives,¹⁴ of which 28.3 percent social cooperatives¹⁵ and 15.3 percent

¹¹ According to the Italian financial regulation, a loan is classified as *sofferenza* when a formal restructuring process or bankruptcy procedure is started.

¹² According to the Italian financial regulation, a loan is classified as *incaglio* if payment (interest and/or principal) is missed since 180 days.

¹³ Application of Basel II rules in Italy by Banca d'Italia establishes that a loan is under default if it is an *incaglio* or a *sofferenza*. Capital adequacy ratios are therefore calculated on the basis of this definition.

¹⁴ Cooperatives differ from traditional for profit firms for their goal of "*prevalente mutualità*". This means that, differently from for profit firms, cooperatives create benefits *not under the prevailing form of profits* for some of their stakeholders. The two main types of traditional cooperatives are *workers cooperatives* (where workers are the dominant stakeholders and attribute to them benefits under the form of safer working conditions and/or participation to profits) and *consumers' cooperatives* (where consumers are the dominant stakeholders and attribute to them benefits under the form of lower prices and higher quality of goods). The Italian law, in exchange of a preferential tax regime for cooperatives, establishes that remuneration of shares of cooperative members must be below those of short term bonds.

¹⁵ Differently from traditional workers' or consumers' cooperatives, social cooperatives pursue the goal of providing a social service to beneficiaries different from their shareholders. According to the Italian law 381/1991, the goal of social cooperatives is social integration, community wellbeing and promotion of the human being. Social cooperatives are of two types: type A social cooperatives

traditional workers and consumers cooperatives or consortia.¹⁶ 46.6 percent are associations,¹⁷ of which 19.8 percent have the special juridical status of ONLUS,¹⁸ 12.4 percent the standard juridical status, while 14.4 percent are non recognised organisations. Residual groups are sole proprietorships (*ditte individuali*), religious organisations and limited liability corporations (*Srl*) (for a total of 10.61 percent). Almost 40 percent of borrowers may be classified as not for profit entities. It is important to remark that 30 percent of borrowers have links with a second level entity (consortia) which may provide informal guarantees (moral but not legally binding obligations) for them.

With regard to the credit position characteristics, 52.6 percent of them are credit lines, 18.6 percent are bank co-signing agreements,¹⁹ while the remaining share are advances on contracts. It is also important to remark that 40 percent of credit positions have been closed, while 60 percent are still ongoing. Looking at loan motivation, expressed by borrowers in credit records, the largest number of positions (37 percent) are provided for liquidity needs and 15 percent as advancement for borrowers' credits toward third parties (a standard typology is that of borrowers with receivables from the public administrations, at national or local level, for the provision of a social service whose payment has been deferred).

manage health and education services, while type B social cooperatives operate in industry, agriculture, trade or service sectors with the goal of inclusion of “disadvantaged” (disabled, ex prisoners) workers (who must be at least 30 percent of the workforce).

¹⁶ The distinguishing feature of Consortia or “second level cooperatives” is that its shareholders are not individuals but cooperatives.

¹⁷ Associations are structured private no profit organisations with non profit distribution constraint. Their fields of action are sport, environment, art, leisure and professional life. Non recognised associations have a more flexible structure (they do not need to report detailed balance sheet data) but some limits (they cannot inherit sums, etc.) with respect to recognised ones.

¹⁸ ONLUS are a special kind of associations whose scope is that of helping people in need and are regulated by law 460/1997. Their most important characteristic is the preferential fiscal treatment (tax deductions and allowances) for those who want to confer financial resources to them.

¹⁹ In the large majority of the Banca Etica's co-signing agreements, the bank guarantees to a third party (usually the government) that an NGO which benefits from a specific government financing will use that money for the goal indicated in the agreement. If this is not the case the bank must repay the entire sum to the government. Cosigning agreements may or may not be covered by real and personal guarantees.

Among loan sectors of destination we find that the majority of them goes to biological destinations (42 percent), followed by international cooperation, domestic health and social assistance activities and domestic cultural activities. 41 percent of loans go to borrowers which are members of second level organisations and therefore part of a larger network.

3. A theoretical benchmark

Consider a one-period model where the lender provides a loan amount of L at the beginning of the period to the borrower, who has to repay it with $L(1+r)$ at the end of the period. The borrower pledges a collateral C , whose net present value is denoted by V .

As in Barro (1976), we assume that the borrower's valuation of the collateral is higher than the lender's. The lower value of collateral by the lender is captured by the transaction costs TC representing costs of property rights transfer and marketing.

Lenders' decision not to ask for collateral depends whether its expected payoff is higher than that of the expected payoff when requiring collateral. In simple terms, the expected payoffs can be expressed as follows:

$$U(\text{Collateral}) = [(1 - E(p_{DF}))L(1+r) - TC]qcD(\text{coll}) + V(\text{coll})E(p_{DF}) \quad (1)$$

$$U(\text{No collateral}) = [(1 - E(p_{DF}))L(1+r)]qcD(\text{no coll}) + (1 - qc)D(\text{no coll})[1 - E(p_{DF})]L(1+r) \quad (1')$$

where $U(\text{collateral})$ and $U(\text{no collateral})$ are respectively borrower's utility function when choosing to ask collateral or not, p_{DF} is the borrower's probability of default, TC is the transaction cost if collateral is requested with $TC > 0$, qc is the share of borrowers that have collateral (bankable) such that $0 \leq qc \leq 1$, $V(\text{coll})$ stands for the net present value of collateral and $D(\text{coll})$ is the effect on the demand of bank loan from the bank's decision of asking collateral with $0 < D < 1$. It is reasonable to assume that $D(\text{no coll}) > D(\text{coll})$.

Hence, demanding collateral has the advantage of obtaining $V(\text{coll})E(p_{DF})$ in case the borrower defaulted on the loan. However, collateralization also entails some costs. First, transaction costs enter the equation and are positive. Second, the lender loses the payoffs derived from the market share of good borrower types who can't afford to pledge collateral. Third, the lender loses some demand since borrowers may find it convenient to borrow from banks not requiring collateral.

If the borrower's probability of default is low, then the lender's best strategy is not to ask for collateral providing him with higher expected payoff. Therefore, borrowers who are ex ante riskier are required to pledge collateral

Finally, it is trivial to note that a multistakeholder approach in which the bank cares about the utility of the borrower will affect negatively the decision to require the collateral.

Based on (1) and (1') consider that $\frac{\partial[U(\text{collateral})-U(\text{No collateral})]}{\partial E(p_{DF})} > 0$

and that $E[p_{DF}] = g[\text{Relationship}, \text{Ex ante Risk}_i, \text{FirmChars}_i, \text{MacroVars}]$

where in square brackets we consider vector of variables measuring the relationship between the lender and the borrower, the ex ante risk of the latter, firm characteristics and macrovariables affecting the borrower's probability of default.

To assess empirically the effects of relationship banking and ex ante borrower's risk, among others on the probability that the bank would ask for collateral to the borrower, we therefore adopt the following specification:

$$\text{Collateral} = \alpha_0 + \alpha_1 \text{Relationship} + \alpha_2 \text{Ex ante Risk} + \sum_i \beta_i \text{FirmChars}_i + \sum_j \delta_j \text{MacroVars}_j + \varepsilon \quad (2)$$

Where the dependent variable is a (0/1) dummy measuring the decision to collateralise the loan. All regressors will be detailed in the next sections.

4. The Econometric design

The goal of our econometric analysis is twofold. First, we want to evaluate the effect of several variables usually considered in this literature on the decision of the bank of asking collateral to the borrower. Second, we want to see whether collateralisation has effects on ex post borrowers' performance.

For the first purpose, based on the benchmark presented in section 3, we estimate a logit model in which the dependent variable is a (0/1) dummy taking value one if the credit activity is collateralised (whatever the collateral type) and zero otherwise.

Among regressors we consider borrower's size, industry affiliation²⁰ and juridical status, credit position type and²¹ classification according type of borrower's action,²² banking type and sector of operation,²³ borrower's geographical location, total number of borrower's outstanding loans, group affiliation or affiliation to a second level organisation,²⁴ a dummy taking value of one if the credit position was proposed and supported by one of the bank board members and a dummy taking value of one whether the borrower before its request had a previous position which was classified as non performing (*sofferenza*), in distress (*incaglio*) or under scrutiny (*sotto osservazione*).²⁵ Among macroeconomic variables we introduce the previous quarter GDP growth, unemployment and (consumer price index) inflation rates calculated by OECD plus the ECB refinancing rate.²⁶

²⁰ No profit, Sanitary Service, Recreation, others, Agriculture, Commercial, R&D. Financial services are the default omitted variable.

²¹ Associations with juridical personality, associations without juridical personality, individual firms and religious entities, social cooperatives, limited liability societies, not for profit organisations. Consumers and workers cooperatives are the default omitted variable.

²² Advances on receivables, purchase/restructuring of tangible assets, Advances on contracts/projects, liquidity needs, co-signing on projects, advances on subsidies. Capital investment is the default omitted variable.

²³ International cooperation, domestic health and assistance services, domestic cultural services, workers' recreation activities. Bio is the default omitted variable. Note that credit sector of operation does not necessarily coincide with borrower's main sector of activity.

²⁴ For a second level organisation we mean a consortium which provides various types of services to its members which cannot be individuals but only juridical entities.

²⁵ The bank classifies a credit position as "sotto osservazione" when it is giving some problems of deferred payment even if it is still not into the state of "incaglio" or "sofferenza".

²⁶ We check in the correlation matrix whether the introduction of the above mentioned controls creates multicollinearity problems. We do not find any evidence of them both in terms of pairwise

Given the heterogeneity in bank's collateralisation decisions (credit positions collateralised with something different from personal collateral only are less than 3 percent) we estimate, in addition to the above mentioned specification, a multinomial logit two equation model where the dependent variable of the first equation takes value one if only a personal collateral has been required to the borrower to open the credit position. The dependent variable of the second equation takes values of one if the type of collateral requested is not only personal (real, consortium, personal plus consortium, real plus consortium).²⁷

Finally, to track ex post performance of collateralised loans we estimate a logit equation in which the dependent variable takes value of one if the credit position goes in *sofferenza*, *incaglio* or *sotto osservazione* and zero otherwise.

The regressors used in this last equation are those of the first equation with the addition of two dummies for personal collateral and all other forms of collateralisation (not only personal collateral) and of an additional variable measuring the length in months of the credit relationship.²⁸

5. Econometric findings

In this section we comment results of the above described econometric specifications by making ample reference to the debate on each variable of interest. More specifically, we start from evaluating the relationship between the decision to pledge collateral with relationship lending (section 5.1) and then move to the role of bank and borrower risk (5.2), multiple lending (5.3), GDP

correlation and covariance of individual regressors with all the other regressors. Findings are omitted and available upon request.

²⁷ We need to group all collateral decisions in which not only a personal collateral is required since observations for these alternative forms of guarantees are too few for estimating an individual equation for each of the collateral types (See Table 3). Significant results in this equation must be interpreted as factors affecting the probability that the bank chooses to ask not only a personal collateral (and opts for the alternative of i) real collateral, ii) consortium collateral or ii) personal collateral combined with real or consortium ones).

²⁸ Such variable is measured, for closed positions, as the distance between the date in which the credit position is opened and its termination and, for open positions, as the distance between the date in which the credit position is opened and the end of the sample period.

(5.4) and geography (5.5). Finally, section 6 comments additional results on the determinants of ex post credit performance by wondering whether the lender's collateralisation decision correctly anticipated the impact on risk of given borrower's characteristics.

5.1 Collateral and relationship lending

Relationship lending is one of the most widely studied modalities of the bank-borrower relationship in the banking literature (Boot, 2000) even though definitions of this concept do not always coincide.

According to Berger (1999) we have relationship lending when: i) the lender collects information which goes beyond balance sheet data, the book and market value of guarantees and all other publicly available information; ii) the additional information is obtained with a direct ongoing relationship with the borrowers and its stakeholders via the provision of a series of (payment, investment, financing) services; iii) information is reserved and confidential and is at the basis of future lender's decisions

According to Boot (2000), who focuses much more on the production side, we have relationship banking when: i) the borrower costly invest to acquire confidential information which he exclusively enjoys; ii) returns of information investments are verified through multiple and repeated interactions.

The experience of Banca Etica reveals a slightly different model. Relationship banking here means close ties with a second level organisation to which the borrower is affiliated, where the former has multiple and repeated relationships with the lender in various cultural and economic initiatives of social entrepreneurship. These repeated interactions allow the lender to bridge informational asymmetries and to acquire information which goes beyond that which can be obtained in loan records. An important element is that the second level organisation almost always intervenes to

rescue the borrower in order to avoid strong reputation and social costs in the network, even though it does not provide in advance any formal guarantee for the borrower's loan. To make it simpler, and to quote an example from the largest social organisation (the church), a borrowing parish does not provide collateral but it never defaults since, in case of financial distress, the intervention of the higher tiers is almost automatic.²⁹ The same reasoning applies to members of other large associations and of consortia of workers and/or consumers cooperatives.

With regard to theoretical explanations of the nexus between collateral and relationship lending, a longstanding tradition argues for the existence of a negative relationship. The standard asymmetric information story is provided by Boot and Thakor (1994): in an infinitely repeated credit market game banks require the provision of collateral to borrowers without a positive track record. If the borrower establishes a private track record, the bank no longer requires collateral.

Many empirical papers in the literature find results consistent with this model observing that borrowers with longer banking relationships are less likely to pledge collateral: i) Chakraborty and Hu (2006) find that the likelihood of collateralizing a line of credit decreases with the length of the bank–borrower relationship; ii) Berger and Udell (1995) obtain similar results on data obtained by telephone interviews with executives of about 3,400 businesses; iii) Harhoff and Korting (1998) Berger et al.,(2006) and Frame and Miller (2006) document that a reduction in asymmetric information lowers the probability that collateral is pledged; v) Degryse and Van Cayseele (2000) find that the collateral requirement is decreasing in the duration of the relationship and increasing in its scope.

²⁹ This is the case at least in Italy where compensations for sexual scandals did not reduce financial capacity as in the US.

In spite of all the above described findings going in the same direction, evidence on the relationship between collateral and relationship lending is surprisingly mixed since a few empirical works find evidence in the opposite direction with respect to the previously mentioned literature.

Elsas and Krahnert (2000) find that relationship lending raises the probability of collateral provision. Menkhoff, Neuberger and Suwanaporn (2006) show that, even in empirical papers on developing countries, long credit relationships do not reduce collateral requirements by lowering information asymmetry. Two are the reasons advanced for explaining these apparently paradoxical results. First, collateral locks the borrower into the relationship. Second, it strengthens the bank's bargaining power, thereby deterring costly conflicts in future renegotiations.

On the empirical side, the literature has tested the effects of relationship lending on the decision to collateralise loans with several proxies. Berger and Udell (1995) measure relationship lending using the proxy of the length of the bank firm relationship. Elsas and Kramert (2000) correctly argue that the use of such proxy has serious limits when (as it is almost always the case) the bank is born before the beginning of the sample period, since the real relationship length is unobservable when the observed one "starts" from the beginning of the sample period. With this respect, the advantage of our database is that of having the universe of borrower's positions since the beginning of the lender's history.

Our results seem to be fully consistent with the standard Boot and Thakor (1994) model (Table 5.1 for the logit estimate and Table 6.1 for the multinomial logit estimate). Net of the positive relationship between bad track record and collateralisation, we observe a negative and significant effect of the number of previous credit positions with the same bank. We try to use also the standard variable of the length of the relationship which is however not significant. Our interpretation is that the length is not represented by a linear time distance between the first and the

last loan but from the number of previous lending relationships. In essence, a ten year distance between the first and the second loan matters less than a five year history of five successful loans. The magnitude of the effect described in Table 5.2 from probit estimate shows that one additional credit position granted in the past raises by 4.9 percent the probability that the collateral is not asked. The magnitude slightly rises to 5.6 in the multinomial logit estimate (Table 6.2)

5.2 The relationship between collateral and bank and borrower risk

The relationship between collateral and credit risk is theoretically ambiguous. Conventional wisdom in banking (see e.g., Berger and Udell, 1990) and the banks' ex post monitoring function (Bester, 1994; Rajan and Winton, 1995) suggest that banks should demand higher collateral from borrowers who are expected to have higher default risks. On the other hand, collateral signalling models predict a negative relationship between collateral and default risk since borrowers with higher quality projects should signal their characteristics by choosing higher collateral (Besanko and Thakor, 1987; Bester, 1985).

Furthermore, models of bank behavior under asymmetric information show that collateralization may reduce adverse selection and moral hazard for two reasons. First, it induces a borrower to reveal his or her default risk, acting as a signalling device (Bester, 1985; Besanko and Thakor, 1987). Second, it provides the borrower with an incentive to exert effort and reveal truthfully the state of his project after having obtained the loan (Bester, 1987 and 1994).

Collateralization may also change the bank's willingness to take risks. By reducing a bank's risk exposure, it may provide an incentive to be less careful, or even to engage in more risky lending. This hypothesis has received only little attention in the literature to date. Three empirical studies that test it in the context of developed economies yield contrasting results. For a UK sample

of bank loans to small and medium-sized enterprises, Cressy and Toivanen (2001) did not find a significant relationship between the default and the incidence of collateral. For US business loans, Berger and Udell (1990) found that collateral was associated with a higher number of borrowers with non-performing loans and higher charge-off rates (a similar result in Spain is found by Jiménez and Saurina, 2004).

Our findings provide two clear cut results: i) ex ante borrower risk (if bad past track record is a good proxy of it) increases the probability of collateralisation (Tables 5.1 and 6.1); ii) collateralised borrowers are not riskier ex post (Table 7.1); iii) other risk factors such as small size and loan duration are positively correlated with the probability of being collateralised (Tables 5.1 and 6.1).

In terms of quantitative effects the presence of a previous record of positions under *incaglio*, *sofferenza* or *sotto osservazione* reduces by 18.3 percent the probability of not being asked a collateral, while large size raises it by 23.6 percent (Table 5.2).

The combination of these findings (collateralised borrowers are ex ante but not ex post riskier) is compatible with the hypothesis that the bank is more likely to pledge collateral from riskier borrowers and that collateral provides incentive effects on the latter. It is more difficult to reconcile our results with the signalling model and with the hypothesis that collateralisation leads to a relaxation of bank monitoring activity.

5.3 Collateral and multiple borrowing

The presence of multiple loans is a proxy of creditworthiness³⁰ and, as such, it should be negatively correlated with credit rationing, however the same variable also indicates that Banca Etica may have a lower probability of being a senior creditor in bankruptcy procedures and therefore should have an opposite (positive) effect on credit rationing.³¹

Our findings evidence that the variable measuring the total number of loans with other banks at the moment of the borrower's demand to open the credit position, is negatively related with the bank's decision to ask a collateral. This finding seems consistent with the first interpretation. Note that the magnitude of the effect is small since one additional external loan from its mean value raises by 1.6 percent the probability of not being asked a collateral (Table 5.2).

5.4 Collateral and GDP

The sign of the GDP coefficient is counterintuitive since it indicates that economic expansion increases the likelihood that the lender will ask collateral. The result may however be interpreted in the light of the "borrower's overoptimism" hypothesis (de Meza and Southey, 1996). If there is asymmetry in project evaluation between the borrower and lender, and the former tends to overrate the expected fruits of his investment, we may assume that overoptimism is sensitive to the business cycle. In such case the bank will find it optimal to reduce its lending risk by being more severe in the collateral decision when economic conditions are more positive.

5.5 Collateral and geography, credit and borrower's type

³⁰ Detragiache, Garella and Guiso (2000) argue that multiple banking reduces the probability of credit rationing and von Thadden (1995) finds that a higher number of lenders reduces banking rent extraction.

³¹ Bolton and Scharfstein (1996) argue how multiple banking may make debt renegotiation more difficult and Petersen and Rajan (1994) show that the passage from single to multiple borrowing increases the cost of credit and reduces its availability

An interesting finding from the multinomial logit estimate is the higher propensity of the bank to ask for personal instead of real guarantees when the borrower is located in the Italian Mezzogiorno (Table 6.1). This result is perfectly reasonable if we consider that costs of evaluating, processing and liquidating collateral heavily depend on the legal and institutional environment.

By looking at other credit characteristics we find that cosigning positions are significantly less collateralized (Tables 5.1 and 6.1). The magnitude of the effect is remarkable since such positions have a 30 percent higher probability of not being guaranteed by a collateral (Tables 5.2 and 6.2). If we consider that, in principle, these positions are not necessarily less risky, a relationship lending effect is at work here. In most of cosigning agreements we have an NGOs authorised to work with the Foreign Ministry in Italy. Being part of this group is a signal of reputation and trustworthiness which affects bank's behaviour. The bank's decision to back an Ngo is a straightforward signal of trust on the borrower which would be in contrast with the decision to ask a collateral

A final interesting finding shows that being an association without juridical status has negative and significant effect of the probability of not being asked a collateral. Here again the magnitude is strong since juridical status raises by 32 percent for associations the probability of not being asked (Tables 5.2 and 6.2). The difference between associations with and without juridical personality is that the former may inherit sum and collect funds directly and have formal accounting obligations. It is therefore clear that the bank will be less likely to collateralise them vis-à-vis those without juridical personality.

6. Does the borrower associate collateralisation to characteristics which increase the risk of bad performance ?

The possibility of comparing ex ante collateralisation choices of the bank and ex post effects of such choices on the borrower's performance allows us to evaluate if the bank correctly anticipates in its decisional process factors of risk when taking lending decisions. Note that we control here for

the credit position length, taking into account that a recently opened position has obviously lower probabilities of having experienced a shock leading to default.

In many cases we find that factors affecting ex post the probability of bad borrower's performance (fall into one of the three status of *sofferenza*, *incaglio* or *sotto osservazione*) do not affect the likelihood of collateralisation ex ante (i.e. the ECB refinancing rate and the inflation rate are significant in the performance but not in the collateralisation estimate). More specifically, an increase of 1 percent of the ECB refinancing rate (unemployment rate) from its mean value raises by 6.2 percent (3.7 percent) the probability of bad performance of the credit position.

In other cases we find that the bank correctly anticipates the risk position of the borrower. Cosigning agreements which are significantly less collateralised (see Table 5.2) have a 16 percent smaller probability of becoming bad loans (Table 7.2).

However, an interesting and paradoxical case is the role of multiple borrowing. The number of the borrower's existing loans with other banks reduces significantly (by 4.9 percent) the probability of asking collateral, while it affects significantly and negatively ex post (by 2.1 percent) the probability of bad borrower's performance (see Tables 5.2 and 7.2). A possible explanation here is that the bank considers important to participate in financing pools or to attract customers already working with other banks and is ready to do so also slackening the collateral requirements. Another more technical explanation is that small or medium sized borrowers already having relationship with other banks may find it more difficult to have assets available for collateralisation.

7. Conclusions

In this paper we investigate for the first time the collateral decision of a multistakeholder oriented "social" bank following a criterion of social welfare maximisation when building its portfolio of credit positions. Another distinctive feature of this bank is that, in order to pursue its goals, it

operates mainly with various not for profit entities (workers, consumers or social cooperatives, associations with or without juridical status, etc.). These features create a unique original perspective on the lender-borrower relationship which worth being explored.

A first important result in our paper comes from descriptive evidence which documents an unusually high share of non collateralised loans. On this point we remind that one of the costs of asking a guarantee on a loan is the (social cost of) the difference between the collateral value to the borrower and its market value (which is also the collateral value to the lender) in case of default.

Taking this into account the relative higher preferences of social banks for internalising welfare costs may contribute to explain why the ratio of non collateralised to collateralised loans is so low.

A shift from the profit maximisation to the satisfaction of a more complex multistakeholder target may justify this result.

Another relevant finding is the effect of relationship lending on collateralisation. As it is well known the empirical literature presents mixed findings on this point. On the one side we have various results indicating a negative relationship (see section 5.1 of the paper). Such results are interpreted by arguing that relationship lending reduces informational asymmetries and its negative consequences on moral hazard and adverse selection. On the other side, we have contributions focusing on the behaviour of Housebanks which find an opposite sign. Our findings are consistent with the first line of the literature.

Finally, the joint interpretation of the effect of the borrower's record on collateralisation and of the latter on the probability of default indicates that collateralised borrowers are riskier ex ante even though their loans do not reveal to be riskier ex post. Even though borrower and loan risk may not exactly coincide such findings seems to suggest that an incentive effect is at work.

References

Barro R. (1976) - The loan market, collateral, and rates of interest, *Journal of Money, Credit, and Banking*, 8, pp. 439-56.

- Becchetti L., and Garcia, M., (2008) Credit rationing and credit view: empirical evidence from loan data, mimeo.
- Besanko D. and Thakor A.V. (1987a) - Collateral and rationing: sorting equilibria in monopolistic and competitive credit markets, *International Economic Review*, 28, 3, pp. 671- 689.
- Besanko D. and Thakor A.V. (1987b) - Competitive equilibrium in the credit market under asymmetric information, *Journal of Economic Theory*, 42, pp. 167-182.
- Berger A. (1999) - The ‘Big Picture’ of relationship finance, in “Business Access to Capital and Credit” (J. L. Blanton, A. Williams, and S. L. Rhine, Eds.), pp. 390–400, A Federal Reserve System Research Conference.
- Berger A.N and Udell G.F. (1990) - Collateral, loan quality, and bank risk, *Journal of Monetary Economics*, 25, 1, pp. 21-42.
- Berger A. and Udell G. F. (1995) - Relationship lending and lines of credit in small firm finance, *The Journal of Business*, 68, 3, pp. 351-381.
- Berger A., Espinosa-Vega M., Frame W.S. and Miller N. (2006) - Why do borrowers pledge collateral? New empirical evidence on the role of asymmetric information, Federal Reserve Bank of Atlanta working paper, 2006-29a.
- Bester H. (1985) - Screening vs. rationing in credit markets with imperfect information. *American Economic Review*, 75, 4, pp. 850-855.
- Bester H. (1987) - The role of collateral in credit market with imperfect information, *European Economic Review*, 31, pp. 887-899.
- Bester H. (1994) - The role of collateral in a model of debt renegotiation, *Journal of Money, Credit and Banking*, 26, 1, pp. 72-86.
- Black J, de Meza D. and Jeffreys D. (1996) - House prices, the supply of collateral and the enterprise economy, *The Economic Journal*, 106, 434, pp. 60-75.
- Bolton P. and Scharfstein D. (1996) - Optimal debt structure and the number of creditors, *Journal of Political Economy*, 104, pp.1–25.
- Boot A.W.A (2000) - Relationship Banking: What Do We Know?, *Journal of Financial Intermediation*, 9, pp. 7–25.
- Boot A.W.A. and Thakor A.V. (1994) - Moral hazard and secured lending in an infinitely repeated credit market game, *International Economic Review*, 35, pp. 899-920.
- Chakraborty A. and Hu C.X. (2006) - Lending relationships in line-of-credit and nonline-of-credit loans: Evidence from collateral use in small business, *Journal of Financial Intermediation*, 15, pp. 86–107.
- Chan Y.S. and Kanatas G. (1985) - Asymmetric valuation and the role of collateral in loan agreements, *Journal of Money, Credit and Banking*, 17, 1, pp. 84-95.
- Clemenz G. (1986) - Credit Markets with Asymmetric Information, *Lecture notes in economics and mathematics systems*, Springer-Verlag, Berlin.
- Coco G. (1999) - Collateral, heterogeneity in risk attitude and the credit market equilibrium, *European Economic Review*, 43, pp. 559-574.
- Coco G. (2000) - On the Use of Collateral, *Journal of Economic Surveys*, 14, 2, pp.191–214.
- Cressy R. and Toivanen O. (2001) - Is there adverse selection in the credit market? *Venture Capital*, 3, 3, pp. 215–238.
- de Meza, D., Southey, C., 1996. The borrower’s curse: optimism, finance and entrepreneurship, *The Economic Journal*, 106, pp. 375-386.
- Degryse H. and Cayseele P.V. (2000) - Relationship lending within a bank-based system: Evidence from European small business data, *Journal of Financial Intermediation*, 9, pp. 90–109.
- Detragiache E., Garella P. and Guiso L. (2000) - Multiple versus single banking relationships: Theory and evidence, *The Journal of Finance*, 55, 3, 1133–1161.
- Elsas R. and Krahnen J.P. (2000) - Collateral, default risk, and relationship lending: An empirical study on financial contracting, CEPR Discussion Paper 2540.
- Harhoff D. and Korting T. (1998) - Lending relationship in Germany - Empirical evidence from

- survey data, *Journal of Banking and Finance*, 22, pp. 1317–1353.
- Jimenez G. and Saurina J. (2004) - Collateral, type of lender and relationship banking as determinants of credit risk, *Journal of Banking and Finance*, 28, 9, pp. 2191-2212.
- Menkhoff, Neuberger, Suwanaporn (2006) - Collateral-based lending in emerging markets: Evidence from Thailand, *Journal of Banking and Finance*, 30, pp. 1-21.
- Petersen, M.A., Rajan, R.G., 1994. The benefits of lending relationships: Evidence from small business data, *Journal of Finance*, 49, pp.3–37.
- Rajan R.G. and Winton A. (1995) - Covenants and collateral as incentives to monitor, *Journal of Finance*, 50, pp. 1113–1146.
- Watson H.(1984) - Credit markets and borrower effort, *Southern Economic Journal*, 50, 3, pp. 802-813.

Table 1. Variables definition

Variable	Definition
Not rationed	1= if amount of credit requested is fully granted; 0=otherwise
Partial rationing	1= if amount of credit requested is partially granted; 0=otherwise
Total rationing	1= if amount of credit requested is completely refused; 0=otherwise
Rationed type (for multinomial logit)	0= if not rationed; 1= if partially rationed; 2 = if totally rationed
Bad credit position	1= if credit position is under <i>incaglio</i> , <i>sofferenza</i> or <i>sotto osservazione</i> (see footnotes 19,20 and 29); 0=otherwise
Employment size	
Large firms	1= if employees > 50; 0=otherwise
Small firms	1= if employees are more than 15 and less than or equal to 50; 0=otherwise
Microfirms	1= if employees ≤15; 0=otherwise
Borrower's Industry	
Financial services	1= if the borrower belongs to the financial industry; 0=otherwise
Not for profit	1= if the borrower belongs to the not-for-profit industry; 0=otherwise
Sanitary Services	1= if the borrower belongs to the sanitary industry; 0=otherwise
Recreation	1= if the borrower belongs to the recreational industry; 0=otherwise
Others	1= if the borrower belongs to other productive services industry; 0=otherwise
Agriculture	1= if the borrower belongs to the agricultural industry; 0=otherwise
Commercial	1= if the borrower belongs to the commercial industry; 0=otherwise
High-tech	1= if the borrower belongs to the high-tech industry; 0=otherwise
Borrower's juridical status	
Consumers' or workers' cooperatives	1= if the borrower is a consumers' or workers' cooperative; 0=otherwise
Associations without juridical status	1= if the borrower belongs to associations without juridical status; 0=otherwise
Associations with juridical status	1= if the borrower belongs to associations with juridical status; 0=otherwise
ONLUS associations	1= if the borrower belongs to association ONLUS; 0=otherwise
Social cooperatives	1= if the borrower is a social cooperative; 0=otherwise
Limited liability companies	1= if the borrower is a limited liability company; 0=otherwise
Other (sole proprietorship, religious organisations)	1= if the borrower is a sole proprietorship or a religious organization; 0=otherwise
Credit position, type of borrower action	
Capital investment	1= if the credit position is for financing capital investment or other nonhuman productive inputs; 0=otherwise
Advances on receivables	1= if the credit position is for advances on receivables; 0=otherwise
Purchase/restructuring of tangible assets	1= if the credit position is for purchasing or restructuring of tangible assets; 0=otherwise
Advances on contracts/projects	1=if the credit position is for advances on contracts or projects; 0=otherwise
Liquidity needs	1= if the credit position is for liquidity needs; 0=otherwise
Cosigning on projects	1= if the credit position is for cosigning on projects; 0=otherwise
Advances on subsidies	1= if the credit position is for advanced payment on subsidies; 0=otherwise
Credit position type	
Advances on documents/contracts	1= if the credit position is classified under advances on documents or contracts; 0=otherwise
Credit lines	1= if the credit position is classified under credit lines; 0=otherwise
Bank cosigning ("credito di firma")	1= if the credit position is classified under bank cosigning; 0=otherwise
Credit position, sector of operation	
Bio	1= if the credit position's social objective is to promote biological products; 0=otherwise
International cooperation	1= if the credit position's social objective is to promote international cooperation; 0=otherwise
Domestic health and social assistance activities	1= if the credit position's social objective is to promote domestic health and social assistance activities; 0=otherwise
Domestic cultural activities	1= if the credit position's social objective is to promote domestic cultural activities; 0=otherwise
Workers' recreation	1= if the credit position's social objective is to promote workers' recreation; 0=otherwise

Table 1. Variables definition (follows)

Variable	Definition
Geographical areas	
North-East	1= if the borrower is located in the North-Eastern part of Italy; 0=otherwise
Isles	1= if the borrower is located in the Isles of Italy; 0=otherwise
North-West	1= if the borrower is located in the North-Western part of Italy; 0=otherwise
South	1= if the borrower is located in the North-Eastern part of Italy; 0=otherwise
Centre	1= if the borrower is located in the Centre; 0=otherwise
Other variables	
Membership in groups	1= if the borrower belongs to a group; 0=otherwise
Membership in ONLUS	1= if the borrower is a member of ONLUS; 0=otherwise
Support of Banca Etica board members	1= if the borrower has the support of Banca Etica board members; 0=otherwise
Membership in second-level	1= if the borrower is a member in second-level organizations; 0=otherwise
No guarantees	1= if the credit position is not collateralized; 0=otherwise
Duration of loans (months),ln	Duration of credit position in logarithms
Total no. of other loans	Total number of other loans
Macrovariables	
Refinancing rate of ESCB, %	Monthly refinancing rate of ESCB, in percent. From March 1999 to August 2006. Source: Bank of Italy
Unemployment rate oecd	Quarterly unemployment rate. Source: OECD Economic Outlook 82
GDP growth rate	GDP growth rate, qoq. Source: GDP (at constant prices), OECD Economic Outlook 82
Inflation rate	Inflation rate, qoq. Source: CPI, OECD Economic Outlook 82

Table borrowed from the twin paper Becchetti and Garcia, (2008).

Table 2 Summary Statistics

Variables	Obs	Mean	Std. Dev.	Min	Max
(Type I or Type II) credit rationing	1009	0.358	0.480	0	1
Bad credit position (Credit position under <i>incaglio</i> , <i>sofferenza</i> or <i>sotto osservazione</i>)	1009	0.350	0.477	0	1
Employment size					
Large firms	1009	0.037	0.188	0	1
Small firms	1009	0.169	0.375	0	1
Microfirms	1009	0.794	0.405	0	1
Borrower's Industry					
Financial services	1009	0.062	0.242	0	1
Not for profit	1009	0.468	0.499	0	1
Sanitary Service	1009	0.081	0.273	0	1
Recreation	1009	0.076	0.266	0	1
Others	1009	0.126	0.332	0	1
Agriculture	1009	0.061	0.240	0	1
Commercial	1009	0.039	0.193	0	1
High-tech	1009	0.086	0.281	0	1
Borrower's juridical status					
Consumers' or workers' cooperatives	1009	0.153	0.360	0	1
Associations without juridical status	1009	0.144	0.351	0	1
Associations with juridical status	1009	0.124	0.330	0	1
ONLUS associations	1009	0.198	0.399	0	1
Social cooperatives	1009	0.282	0.450	0	1
Limited liability companies	1009	0.051	0.219	0	1
Other (sole proprietorship, religious organisations)	1009	0.049	0.215	0	1
Credit position, type of borrower action					
Capital investment	1009	0.065	0.247	0	1
Advances on receivables	1009	0.197	0.398	0	1
Purchase/restructuring of tangible assets	1009	0.015	0.121	0	1
Advances on contracts/projects	1009	0.108	0.311	0	1
Liquidity needs	1009	0.371	0.483	0	1
Cosigning on projects	1009	0.151	0.358	0	1
Advances on subsidies	1009	0.093	0.291	0	1
Credit position type					
Advances on documents/contracts	1009	0.287	0.453	0	1
Credit lines	1009	0.526	0.500	0	1
Bank cosigning	1009	0.186	0.390	0	1
Credit position, sector of operation					
Bio	1009	0.420	0.494	0	1
International cooperation	1009	0.140	0.347	0	1
Domestic health and social assistance activities	1009	0.192	0.394	0	1
Domestic cultural activities	1009	0.167	0.374	0	1
Workers' recreation	1009	0.080	0.272	0	1
Geographical areas					
North-East	1009	0.231	0.422	0	1
Isles	1009	0.021	0.143	0	1
North-West	1009	0.183	0.387	0	1
South	1009	0.188	0.391	0	1
Centre	1009	0.377	0.485	0	1
Other variables					
Membership in groups	1009	0.073	0.261	0	1
Membership in ONLUS	1009	0.480	0.500	0	1
Support of Banca Etica board members	1009	0.040	0.195	0	1
Membership in second-level	1009	0.412	0.492	0	1
No guarantees	1009	0.419	0.494	0	1
Duration of loans (months),ln	1009	2.498	0.599	0.000	5.220
Total no. of other loans	1009	1.632	2.261	0.000	16.000
No. of credit positions granted before	1009	1.320	2.073	0	14
Credit position length	1007	21.744	19.227	0	92
Macrovariables					
Refinancing rate of ESCB, %	1009	2.735	0.939	2.000	4.750

Unemployment rate	1009	8.591	0.950	6.691	11.355
GDP growth rate, qoq	1009	1.112	1.262	-0.526	3.925
Inflation rate, qoq	1009	2.347	0.340	1.394	3.053

Table 3 Breakdown of the collateral decision

Collateral type	Freq.	Percent	Cum.
No collateral	423	41.92	41.92
Personal collateral	532	52.73	94.65
Real collateral	32	3.17	97.82
Consortium trust	22	2.18	100
Total	1,009	100	

Collateral definition	Freq.	Percent	Cum.
No collateral	423	41.92	41.92
Personal collateral only	532	52.73	94.65
Real collateral only	25	2.48	97.13
Personal + Real collateral	7	0.69	97.82
Consortium collateral only	15	1.49	99.31
Consortium + Personal collateral	7	0.69	100
Total	1,009	100	

Tab. 4. Descriptive statistics on the collateralised/uncollateralized loans

Bad credit position before credit request									
	No collateral		Personal		Real		Consortium		Total
0	397	42%	503	53%	26	3%	21	2%	947
1	26	42%	29	47%	6	10%	1	2%	62
Total	423	42%	532	53%	32	3%	22	2%	1,009
Bad credit position after credit request									
	No collateral		Personal		Real		Consortium		Total
0	301	42%	378	53%	27	4%	12	2%	718
1	122	42%	154	53%	5	2%	10	3%	291
Total	423	42%	532	53%	32	3%	22	2%	1,009
Year of credit request									
	No collateral		Personal		Real		Consortium		Total
1999	11	28%	27	68%	0	0%	2	5%	40
2000	42	39%	66	61%	1	1%	0	0%	109
2001	53	43%	65	53%	2	2%	2	2%	122
2002	48	42%	63	55%	3	3%	1	1%	115
2003	69	44%	80	51%	2	1%	5	3%	156
2004	69	38%	97	54%	10	6%	4	2%	180
2005	110	49%	100	44%	10	4%	5	2%	225
2006	21	34%	34	55%	4	6%	3	5%	62
Total	423	42%	532	53%	32	3%	22	2%	1,009
Borrower's juridical status									
	No collateral		Personal		Real		Consortium		Total
ONLUS associations	106	53%	83	42%	11	6%	0	0%	200
Limited liability companies	20	39%	30	59%	0	0%	1	2%	51
Social cooperatives	84	29%	187	66%	4	1%	10	4%	285
Consumers' or workers' cooperatives	55	36%	86	56%	6	4%	7	5%	154
Associations with juridical status	75	60%	47	38%	3	2%	0	0%	125
Associations without juridical status	63	43%	76	52%	6	4%	0	0%	145
Other (sole proprietorship, religious organizations)	20	41%	23	47%	2	4%	4	8%	49
Total	423	42%	532	53%	32	3%	22	2%	1,009
Credit position type									
	No collateral		Personal		Real		Consortium		Total
Advances on documents/contracts	112	39%	166	57%	4	1%	8	3%	290
Bank cosigning	125	66%	56	30%	7	4%	0	0%	188
Credit line	186	35%	310	58%	21	4%	14	3%	531
Total	423	42%	532	53%	32	3%	22	2%	1,009
Credit position, type of borrower action									
	No collateral		Personal		Real		Consortium		Total
Capital investment	30	45%	27	41%	6	9%	3	5%	66
Advances on subsidies	40	43%	54	57%	0	0%	0	0%	94
Cosigning on projects	98	64%	48	32%	6	4%	0	0%	152
Liquidity needs	121	32%	228	61%	13	3%	12	3%	374
Advances on contracts/projects	49	45%	56	51%	2	2%	2	2%	109
Purchase restructuring of tangible assets	5	33%	7	47%	3	20%	0	0%	15
Advances on receivables	80	40%	112	56%	2	1%	5	3%	199
Total	423	42%	532	53%	32	3%	22	2%	1,009
Credit position, sector of operation									
	No collateral		Personal		Real		Consortium		Total
Bio	155	37%	242	57%	16	4%	11	3%	424
Workers' recreation	22	27%	54	67%	1	1%	4	5%	81
Domestic cultural activities	63	37%	99	59%	2	1%	5	3%	169
Domestic health and social assistance activities	82	42%	105	54%	5	3%	2	1%	194

International cooperation	101	72%	32	23%	8	6%	0	0%	141
Total	423	42%	532	53%	32	3%	22	2%	1,009
Borrower size	No collateral		Personal		Real		Consortium		Total
Large firms	24	65%	11	30%	2	5%	0	0%	37
Small firms	70	41%	86	50%	5	3%	10	6%	171
Microfirms	329	41%	435	54%	25	3%	12	1%	801
Total	423	42%	532	53%	32	3%	22	2%	1,009
Borrower's industry	No collateral		Personal		Real		Consortium		Total
High-Tech	36	41%	48	55%	1	1%	2	2%	87
Commercial	14	36%	25	64%	0	0%	0	0%	39
Agriculture	17	27%	41	66%	3	5%	1	2%	62
Finance	29	46%	29	46%	2	3%	3	5%	63
Others	40	31%	78	61%	4	3%	5	4%	127
Recreation	25	32%	45	58%	2	3%	5	6%	77
Sanitary Services	23	28%	53	65%	0	0%	6	7%	82
Not for Profit	239	51%	213	45%	20	4%	0	0%	472
Total	423	42%	532	53%	32	3%	22	2%	1,009
Geographical areas	No collateral		Personal		Real		Consortium		Total
Isles	1	5%	19	90%	1	5%	0	0%	21
Center	172	45%	200	53%	8	2%	0	0%	380
South	70	37%	116	61%	1	1%	3	2%	190
North-West	87	47%	84	45%	13	7%	1	1%	185
North-East	93	40%	113	48%	9	4%	18	8%	233
Total	423	42%	532	53%	32	3%	22	2%	1,009
Support of Banca Etica board member(s)	No collateral		Personal		Real		Consortium		Total
0	401	41%	518	53%	31	3%	19	2%	969
1	22	55%	14	35%	1	3%	3	8%	40
Total	423	42%	532	53%	32	3%	22	2%	1,009
Membership in ONLUS	No collateral		Personal		Real		Consortium		Total
0	226	43%	270	51%	17	3%	12	2%	525
1	197	41%	262	54%	15	3%	10	2%	484
Total	423	42%	532	53%	32	3%	22	2%	1,009
Membership in groups	No collateral		Personal		Real		Consortium		Total
0	393	42%	493	53%	30	3%	19	2%	935
1	30	41%	39	53%	2	3%	3	4%	74
Total	423	42%	532	53%	32	3%	22	2%	1,009
No. of credit positions granted before	No collateral		Personal		Real		Consortium		Total
0	166	32%	329	63%	12	2%	12	2%	519
1	87	46%	89	47%	10	5%	4	2%	190
2	55	47%	57	48%	5	4%	1	1%	118
3	32	51%	28	44%	2	3%	1	2%	63
4	13	41%	17	53%	1	3%	1	3%	32
5	18	72%	4	16%	0	0%	3	12%	25
6	22	79%	6	21%	0	0%	0	0%	28
7	12	86%	1	7%	1	7%	0	0%	14
8	5	83%	1	17%	0	0%	0	0%	6
9	5	100%	0	0%	0	0%	0	0%	5
10	2	100%	0	0%	0	0%	0	0%	2
11	2	67%	0	0%	1	33%	0	0%	3
12	1	100%	0	0%	0	0%	0	0%	1
13	2	100%	0	0%	0	0%	0	0%	2
14	1	100%	0	0%	0	0%	0	0%	1
Total	423	42%	532	53%	32	3%	22	2%	1,009

Tab. 4. Descriptive statistics on the collateralised/uncollateralized loans (follows)

	No collateral	Mean	StD. Dev	Min	Max
Duration of loans, ln	423	2.43	0.67	0	4.804021
Total no. of other loans	423	1.77	2.41	0	12
Refinancing rate, monthly	423	2.71	0.93	2	4.75
Unemployment rate, quarterly	423	8.54	0.89	6.91	11.35
GDP growth rate, qoq	423	1.00	1.20	-0.53	3.92
Inflation rate, qoq	423	2.35	0.35	1.39	3.05
Credit position length	423	20.00	19.01	0	92
	Personal	Mean	StD. Dev	Min	Max
Duration of loans, ln	532	2.53	0.52	0.69	5.22
Total no. of other loans	532	1.46	2.00	0	16
Refinancing rate, monthly	532	2.79	0.96	2	4.75
Unemployment rate, quarterly	532	8.67	1.00	6.69	11.35
GDP growth rate, qoq	532	1.24	1.32	-0.53	3.92
Inflation rate, qoq	532	2.36	0.34	1.39	3.05
Credit position length	530	22.98	19.62	1	83
	Real	Mean	StD. Dev	Min	Max
Duration of loans, ln	32	2.84	0.76	2.30	5.21
Total no. of other loans	32	2.25	3.33	0	12
Refinancing rate, monthly	32	2.42	0.78	2	4.5
Unemployment rate, quarterly	32	8.10	0.65	6.91	10.08
GDP growth rate, qoq	32	0.75	0.92	-0.53	3.92
Inflation rate, qoq	32	2.19	0.30	1.85	3.05
Credit position length	32	24.53	13.95	10	73
	Consortium	Mean	StD. Dev	Min	Max
Duration of loans, ln	22	2.53	0.24	2.08	3.14
Total no. of other loans	22	2.36	3.05	0	11
Refinancing rate, monthly	22	2.33	0.46	2	3.25
Unemployment rate, quarterly	22	8.40	0.97	7.31	11.10
GDP growth rate, qoq	22	0.70	0.90	-0.16	3.40
Inflation rate, qoq	22	2.24	0.30	1.72	2.74
Credit position length	22	21.36	18.61	8	77

Tab. 5.1 The determinants of the decision not to pledge collateral (logit estimate)

LOGIT	No collateral	
	Coeff.	SE
Bad credit position ex ante	-0,843	0.347**
Borrower's size (default: 15≤employees<50)		
Microfirms	-0,072	0,206
Large firms	0,962	0.448**
Borrower's industry (default: financial services)		
Not for profit	-0,552	0,652
Sanitary Service	-0,64	0,461
Recreation	-0,367	0,434
Others	-0,066	0,377
Agriculture	-0,607	0,438
Commercial	0,023	0,481
High-Tech	-0,031	0,389
Borrower's juridical status (default: workers' or consumers' cooperatives)		
Associations without juridical status	0,749	0,614
Associations with juridical status	1,339	0.597**
Other (sole proprietorship, religious organizations)	0,555	0,392
Social cooperatives	-0,529	0,416
Limited liability companies	0,354	0,388
ONLUS associations	-0,305	0,73
Credit position, type of borrower action (default: capital investment)		
Advances on receivables	0,031	0,393
Purchase/restructuring of tangible assets	-0,587	0,629
Advances on contracts/projects	-0,09	0,398
Liquidity needs	-0,31	0,318
Cosigning on projects	-0,538	0,522
Advances on subsidies	0,038	0,386
Credit position type (default: advances on documents/contracts)		
Credit lines	-0,168	0,265
Cosigning	1,255	0.446***
Credit position, sector of operation (default: Bio)		
International cooperation	1,134	0.338***
Domestic health and social assistance activities	0,1	0,242
Domestic cultural activities	-0,038	0,236
Workers' recreation	-0,366	0,306
Geographical areas (default: North-East)		
Isles	-2,057	1.058*
North-West	0,286	0,229
South	-0,239	0,234
Center	0,011	0,198
Other variables		
Membership in groups	0,209	0,317
Membership in ONLUS	0,634	0.378*
Support of Banca Etica board member(s)	0,235	0,47
Membership in second-level	-0,132	0,156
Duration of loans (months),ln	-0,507	0.116***
Total no. of other loans	0,064	0.037*
No. of credit positions granted before	0,202	0.047***
Macrovariables		
Refinancing rate of ESCB, %	0,157	0,131
Unemployment rate	0,041	0,079
GDP growth rate qoq	-0,168	0.086**
Inflation rate qoq	-0,016	0,254
Wald χ^2		205.35
(Prob> χ^2)		0.0000
Number of observations		1009

qoq = quarterly rate of growth. Variable legend: see Table 1.

* p<0.10, ** p<0.05, *** p<0.01

Table 5.2 Marginal effects of decision not to pledge collateral, significant variables

LOGIT Marginal effects	No collateral	
	Coeff.	SE
Bad credit position ex ante	-0.183	0.065***
Large firm	0.236	0.104**
Associations with juridical status	0.321	0.129**
Bank cosigning	0.304	0.101***
International cooperation	0.276	0.077***
Isles	-0.336	0.084***
Membership in ONLUS	0.153	0.090*
Duration of loans (months),ln	-0.123	0.028***
Total no. of other loans	0.016	0.009*
No. of credit positions granted before	0.049	0.011***
GDP growth rate, qoq	-0.041	0.021**

qoq = quarterly rate of growth. Variable legend: see Table 1.

* p<0.10, ** p<0.05, *** p<0.01

Tab. 6.1 The determinants of the decision not to pledge collateral (multinomial logit estimate)

COLLATERAL, MLOGIT (coltype4)	Personal collateral		Not only personal	
	Coeff.	SE	Coeff.	SE
Bad credit position ex ante	0,796	0.364**	1,308	0.546**
Borrower's size (default: 15≤employees<50)				
Microfirms	0,098	0,214	-0,5	0,375
Large firms	-0,971	0.467**	-1,441	0.861*
Borrower's industry (default: financial services)				
Not-for-Profit	0,508	0,65	0,516	1,511
Sanitary Service	0,527	0,476	1,427	0.855*
Recreation	0,234	0,45	1,135	0,838
Others	0,01	0,39	0,438	0,733
Agriculture	0,602	0,45	0,441	0,929
Commercial	0,097	0,487	-36,818	0.766***
High-tech	0,016	0,397	-0,509	0,942
Borrower's juridical status (default: workers' or consumers' cooperatives)				
Associations without juridical status	-0,745	0,606	-0,604	1,545
Associations with juridical status	-1,28	0.589**	-1,825	1,45
Other (sole proprietorship, religious organizations)	-0,637	0,404	0,253	0,619
Social cooperatives	0,559	0,439	0,471	0,606
Limited liability companies	-0,267	0,397	-1,566	1,141
ONLUS associations	0,304	0,738	0,737	1,576
Credit position, type of borrower action (default: capital investment)				
Advances on receivables	0,119	0,404	-0,986	0,878
Purchase/restructuring of tangible assets	0,487	0,618	1,344	1,125
Advances on contracts/projects	0,266	0,406	-0,973	0,938
Liquidity needs	0,429	0,329	-0,196	0,537
Cosigning on projects	0,708	0,551	-0,543	1,17
Advances on subsidies	0,187	0,395	-36,93	0.575***
Credit position type (default: advances on documents/contracts)				
Credit lines	0,126	0,272	0,337	0,683
Cosigning	-1,266	0.472***	-1,159	0,945
Credit position, sector of operation (default: Bio)				
International cooperation	-1,252	0.354***	0,232	0,733
Domestic health and social assistance activities	-0,074	0,248	-0,182	0,541
Domestic cultural activities	0,06	0,24	-0,18	0,57
Workers' recreation	0,405	0,315	0,097	0,608
Geographical areas (default: North-East)				
Isles	2,193	1.048**	1,238	1,583
North-West	-0,225	0,235	-0,59	0,435
South	0,385	0,24	-1,403	0.610**
Center	0,152	0,204	-1,794	0.477***
Other variables				
Membership in groups	-0,251	0,323	-0,053	0,59
Membership in ONLUS	-0,628	0,397	-0,954	0,624
Support of Banca Etica board member(s)	-0,359	0,483	0,447	0,637
Membership in second-level	0,178	0,161	-0,284	0,355
Duration of loans (months),ln	0,415	0.118***	1,228	0.241***
Total no. of other loans	-0,078	0.040**	0,03	0,072
No. of credit positions granted before	-0,228	0.048***	-0,086	0,099
Macrovariables				
Refinancing rate of ESCB, %	-0,119	0,135	-0,566	0.342*
Unemployment rate	-0,058	0,08	-0,203	0,175
GDP growth rate qoq	0,182	0.087**	0,111	0,204
Inflation rate qoq	0,008	0,261	-0,175	0,511
Wald χ^2			61238.40	
(Prob> χ^2)			0.0000	

qoq = quarterly rate of growth. Variable legend: see Table 1. Base outcome is no collateral.

* p<0.10, ** p<0.05, *** p<0.01

Table 6.2. Marginal effects of the decision not to pledge collateral, significant variables

MLOGIT Marginal effects	No collateral		Personal Collateral		Not only personal	
	Coeff.	SE	Coeff.	SE	Coeff.	SE
Bad credit position ex ante	-0.181	0.073**	0.18	0.073**	0.0002778	0.00025
Large firms	0.236	0.104**	-0.236	0.104**	-0.0001575	0.00009*
Associations with juridical status	0.306	0.125**	-0.305	0.125**	-0.000197	0.00015
Limited liability companies	0.067	0.099	-0.066	0.099	-0.0001963	0.00009**
Advances on contracts/projects	-0.064	0.096	0.064	0.096	-0.0001837	0.00011*
Advances on subsidies	-0.042	0.095	0.05	0.095	-0.008	0.002***
Bank cosigning	0.305	0.103***	-0.305	0.103***	-0.0001133	0.00016
International cooperation	0.3	0.076***	-0.3	0.076***	0.0002555	0.00031
Isles	-0.367	0.082***	0.367	0.082***	-0.0000861	0.00019
South	-0.093	0.056*	0.093	0.056*	-0.0002623	0.00007***
Center	-0.037	0.05	0.038	0.05	-0.0004135	0.00012***
Duration of loans (months),ln	-0.102	0.029***	0.102	0.029***	0.0002395	0.00007***
Total no. of other loans	0.019	0.010**	-0.019	0.010**	0.0000178	0.00002
No. of credit positions granted before	0.056	0.012***	-0.056	0.012***	0.0000101	0.00002
GDP growth rate, qoq	-0.045	0.021**	0.045	0.021**	2.02E-06	0.00005

qoq = quarterly rate of growth. Variable legend: see Table 1. * p<0.10, ** p<0.05, *** p<0.01

Tab. 7.1 Variables affecting credit nonperformance, logit with credit position length

Bad credit position ex post	Coeff.	SE
Personal collateral	0.205	0.17
Not only personal collateral	0.024	0.389
Borrower's size (default: 15≤employees<50)		
Microfirms	-0.218	0.224
Large firms	0.159	0.454
Borrower's industry (default: financial services)		
Not-for-Profit	-1.489	0.623**
Sanitary Service	-2.082	0.486***
Recreation	-2.063	0.507***
Others	-2.342	0.419***
Agriculture	-1.155	0.434***
Commercial	-1.16	0.490**
High-tech	-0.965	0.399**
Borrower's juridical status (default: workers' or consumers' cooperatives)		
Associations without juridical status	-0.056	0.57
Associations with juridical status	0.389	0.559
Other (Sole proprietorship, religious organizations)	0.22	0.463
Social cooperatives	-0.001	0.449
Limited liability companies	-0.75	0.401*
ONLUS associations	0.595	0.72
Credit position, type of borrower action (default: capital investment)		
Advances on receivables	-0.603	0.377
Purchase/restructuring of tangible assets	-0.315	0.669
Advances on contracts/projects	-0.472	0.374
Liquidity needs	-0.604	0.291**
Cosigning on projects	0.408	0.529
Advances on subsidies	-0.533	0.38
Credit position type (default: advances on documents/contracts)		
Credit lines	-0.068	0.274
Cosigning	-0.996	0.506**
Credit position, sector of operation (default: Bio)		
International cooperation	0.578	0.319*
Domestic health and social assistance activities	0.047	0.28
Domestic cultural activities	0.102	0.27
Workers' recreation	0.587	0.344*
Geographical areas (default: North-East)		
Isles	0.451	0.554
North-West	-1.084	0.263***
South	-0.355	0.273
Center	-0.27	0.203
Other variables		
Membership in groups	0.707	0.307**
Membership in ONLUS	-0.28	0.444
Support of Banca Etica board member(s)	-0.951	0.509*
Membership in second-level	-0.258	0.172
Duration of loans (months).ln	-0.222	0.147
Total no. of other loans	0.108	0.037***
No. of credit positions granted before	0.071	0.043*
Credit position length	0.009	0.005*
Macrovariables		
Refinancing rate of ESCB, %	0.325	0.142**
Unemployment rate	0.192	0.084**

GDP growth rate, q-o-q	-0.025	0.086
Inflation rate, q-o-q	-0.424	0.27
Wald χ^2	237.05	
(Prob> χ^2)	0.0000	
Number of observations	1007	

qoq = quarterly rate of growth. Variable legend: see Table 1. * p<0.10, ** p<0.05, *** p<0.01

Table 7.2 . Variables affecting credit nonperformance (Marginal effects)

Bad credit position ex post (logit)	Coeff.	SE
Not-for-Profit	-0.274	0.110**
Sanitary Service	-0.242	0.031***
Recreation	-0.24	0.031***
Others	-0.275	0.029***
Agriculture	-0.166	0.044***
Commercial	-0.164	0.048***
High-tech	-0.148	0.048***
Limited liability companies	-0.119	0.051**
Advances on receivables	-0.105	0.059*
Liquidity needs	-0.111	0.051**
Bank cosigning	-0.161	0.067**
International cooperation	0.121	0.072*
North-West	-0.172	0.033***
Membership in groups	0.153	0.072**
Support of Banca Etica board member(s)	-0.143	0.056**
Total no. of other loans	0.021	0.007***
No. of credit positions granted before	0.014	0.008*
Credit position length	0.002	0.001*
Refinancing rate of ESCB, %	0.062	0.027**
Unemployment rate	0.037	0.016**

qoq = quarterly rate of growth. Variable legend: see Table 1. * p<0.10, ** p<0.05, *** p<0.01