Do Firm-Bank 'Odd Couples' Exacerbate Credit Rationing?*

Giovanni Ferri
University of Bari

Pierluigi Murro†
LUISS University

August 2012

Abstract

This paper tests the impact of an imperfect bank-firm type match on firms' financial constraints using a dataset of about 4,500 Italian manufacturing firms. We start considering an optimal matching of opaque (transparent) borrowing firms with relational (transactional) lending main banks. Next we contemplate the possibility that firm-bank "odd couples" materialize where opaque (transparent) firms end up matched with transactional (relational) main banks. Our results show that more than 25% of the firms falls into an "odd couple". Moreover, we find that the probability of rationing is larger when firms and banks match in "odd couples". We conjecture the "odd couples" emerge either since the bank's lending technology is not perfectly observable to the firm or because riskier firms - even though opaque - strategically select transactional banks in the hope of being classified as lower risks.

JEL Codes: G21, D82, G30

Keywords: Bank-Firm Relationships, Asymmetric Information, Credit Rationing.

1 Introduction

Whether enough bank credit is available to meet the demand of the small and medium-sized enterprises (SMEs) makes a key issue for academia as well as being a major concern for the policy makers throughout the world. The theoretical models embodying the problems of adverse selection and of moral hazard of the borrowers – stemming from the information asymmetry between them and the lenders – typically prognosticate some of the borrowers will be credit rationed in the equilibrium (see, e.g., Jaffe and Russell, 1976; Stiglitz and Weiss, 1981). This prescription has a lemma for the SMEs. Since they are normally more opaque to external scrutiny with respect to the other enterprises, it is expected that the SMEs will be particularly subject to credit rationing exactly because the asymmetry of information is greater for them. Therefore, it may be more difficult for the SMEs to obtain loans (Berger and Udell, 2006). A further aspect making the SMEs more financially vulnerable than the other enterprises descends from their virtually exclusive reliance on bank financing as a source of external funding, as these firms very rarely tap the financial markets to issue stocks or debt securities. In turn, by limiting the access to external finance, their graver asymmetries of information could jeopardize SMEs' investment and output levels.

In this paper, we posit that an imperfect bank-type/firm-type match could result in more severe financial constraints for the borrowing firms. To be sure, if the business technology employed by the bank turns out to be inappropriate to the needs of the borrower, then the asymmetries of information might be amplified by that imperfect match. Indeed, the idea that banks do differ in the way they approach their lending is in line with a new strand of the literature that, in recent years, has investigated the methods through which the SMEs are financed by banks (Berger and Udell, 2006). The

*We wish to thank participants at the Financial Intermediation Research Society Annual Conference held in Minneapolis in June 2012. We also thank Hans Degryse, Xavier Freixas, Moshe Kim, Steven Ongena, Rajdeep Sengupta and Emanuele Tarantino for their helpful suggestions. All remaining errors are ours.

†Corresponding author. Email: pmurro@luiss.it

literature (see, e.g., Rajan, 1992; Elyasani and Goldberg, 2004) highlights two extreme specific lending technologies: the transaction lending technology – typically based (only) on "hard" information (e.g. borrowers' balance sheets and/or collateral guarantees) – vs. the relationship lending technology – based instead on "soft" information (obtained via personal interaction/acquaintance and difficult to codify). This approach holds that the transaction lending technology is more desirable for more informationally transparent firms, while the relationship lending technology is more appropriate for the more opaque firms (suffering more intense asymmetries of information).

To our knowledge, up to now, no researcher has investigated the causes and the consequences of an imperfect match, i.e. a situation in which the information characteristics of the firms and the lending technology of its bank are not aligned. Obviously, in a perfect capital market this problem would be immaterial, and an imperfect match should not have consequences. In case an enterprise finds out ex post it chose the "wrong" type of bank – that is the bank the firm selected in view of its own firm-type turned out to be of the opposite type – it will immediately switch to another more "appropriate" bank (at least on the basis of the firm's ex ante perception). However, considering that transaction and information costs could make changing the banking partner cumbersome, the enterprise might risk being stuck (for a while) with the wrong bank, thereby possibly suffering more credit rationing than would have resulted from a perfect match.

The objective of this paper is to help fill this gap. Specifically, we aim to shed light on whether an imperfect match affects the probability that firms will suffer credit rationing. We identify an imperfect match as a situation in which the ex ante lending technology criteria employed by the firm to select its main bank turned out not to be satisfied ex post by the chosen bank. To address this issue, we use a survey micro-data referring to the end of 2006 and coming from the Tenth Survey of Italian Manufacturing Enterprises run by UniCredit Group. This survey constitutes an ideal testing ground for three main reasons. First of all, this wave of the UniCredit Survey introduced a new set of questions that allow us to learn the lending technology criteria according to which each firm selected ex ante its main banking partner and also whether the firm finds out ex post that, indeed, the selected bank practices those expected lending technologies. Second, the small and medium size of the businesses and the central role of banks in the external financing of investment renders Italy an ideal environment to study the firm-main bank relationship. Third, the UniCredit survey provides a direct measure of credit rationing (the survey considers a firm credit rationed if the firm demanded more credit than it received) and detailed information about firm characteristics, which allows us to control for various factors that may also affect credit rationing, such as productivity, size, age, capital intensity, cash flow.

Our results show that more than 25% of the firms fall into an odd couple. Assuming rational behavior on the part of the enterprise, its falling into an inconsistent match evokes the possibility that even banks may be opaque for borrowing firms, being it difficult for the latter to know precisely ex ante what the lending technology used by the bank will actually be.[1] After controlling for various firms attributes that may affect credit rationing, we estimate that the probability of rationing increases when the firm ends up in an inconsistent match with its main bank. This result holds regardless of whether we focus on the local banks or the national banks. We also obtain evidence that firms holding a more intense relationship with their main bank (as indicated by the length of the credit relationship) appear to be more credit rationed than firms with shorter credit relationships. Finally, our findings show that the number of credit relationships increases the probability of rationing, while that probability decreases if the bank's loan officer does not change.

The paper is organized as follows. Section 2 briefly discusses the literature on credit rationing and on the ways for the SMEs to get external finance. Section 3 discusses the predictions of the theoretical literature. Section 4 is devoted to present the data set we use, explaining also our methodology to construct the variables we use as well as our econometric strategy. In section 5, we show our main results. Section 6 concludes the paper.

[1] In this situation, there is double-sided information asymmetry. As in the previous literature, the bank does not know exactly the type of the borrowing applicant. However, in addition to that, also the firm knows only imperfectly which bank type it is selecting.

2 Survey of the Literature

The issue of credit rationing has been the focus of many theoretical contributions. Typically, the literature derives credit rationing from the existence of asymmetries of information and of agency problems. This is the case, among others, for two influential papers like Hubbard (1990), and Bernanke and Gertler (1995) highlighting that credit rationing can negatively impinge on companies' output and investment and, through this, damage the macroeconomy. These works are founded on the results obtained earlier by Jaffe and Russell (1976), and Stiglitz and Weiss (1981), who show the mechanisms through which credit rationing can persist in equilibrium. In Stigilitz and Weiss (1981) the bank – being unable to control all the actions of its borrowers – writes its contracts in a way to provide them incentives to take those decisions favoring the bank and to attract low risk borrowers. That strategy raises the bank's expected return by less than the increase in the loan rate up to a certain level of the interest rate. Beyond that threshold any increase in the loan rate will cause the expected return to lower – because of the negative self-selection effect of the increased rate that twists the composition of the borrowing pool away from safe and towards risky applicants. Accordingly, the loan rate at which the bank maximizes her expected profit is exactly the one of equilibrium. Naturally, it is possible – indeed, this will be the norm – that at that interest rate the demand for loans exceeds the related supply. However, because of the mentioned adverse selection impact of any further increase, the loan rate will not be increased by the bank and the demand not satisfied will be rationed. This is one of the best known examples of real rigidities depending on market failures.

Various subsequent papers evaluate the possibility that the banks could be able to partly solve that market failure via their own work and expertise. Specifically, through adequate screening and monitoring procedures, the bank can (at least partly) overcome the asymmetric information and incentive problems (Diamond, 1984; Bhattacharya and Thakor, 1993) and, thus, reduce enterprises' liquidity constraints. However, the extent to which a bank succeeds in overcoming the information asymmetry and in providing the appropriate incentive for borrowers to avoid opportunistic behavior depends also on its lending technology. Mainstream literature generally distinguishes two ways in which SMEs are financed by banks, depending on the type of information which is exchanged between the firm and the bank. A transaction lending technology refers to a firm-bank report in which the bank obtains from the borrowing firm "hard" type information, that is quantitative in nature and, so, easily transferable. At the other extreme, a relationship lending technology hinges on "soft" information, that is qualitative information that is normally obtained via long-term informal/personal interaction and are, therefore, much more difficult to transfer (Berger and Udell, 2006).

Both the theoretical and the empirical literature have mainly focused on the characteristics and the possible pros/cons of relationship lending. This is, in fact, considered the most appropriate technology to lend to firms with significant informational asymmetries, as a tighter firm-bank relationship helps overcome those informational asymmetries, improving the efficiency of the bank's allocation of loans. Boot (2000) defines relationship lending as "the provision of financial services by a financial intermediary that: i. invests in obtaining customer-specific information, often proprietary in nature; and ii. evaluates the profitability of these investments through multiple interactions with the same customer over time and/or across products". The definition hinges on two crucial aspects: eliciting the release of proprietary information from the client to the bank and the presence of multiple interactions between the two parts.

Some theoretical contributions have tried to model the features of this firm-bank relationship. Rajan (1992) stresses the widely recognized advantages of bank financing. In practice, thanks to their ability to reduce adverse selection problems (owing better information) and to lower also the moral hazard (by controlling borrowing firms investment decisions), the banks can offer the SMEs "informed" external funds that will be cheaper than those "less informed" funds the SMEs can obtain from transactional lenders. Diamond (1991) highlights that the firm-bank relationship by itself can solve the moral hazard problem for the firms, since the reputation cumulated through a good past track record dampens the risk of adverse selection. However, the rose of relationship lending also has its thorns, and some authors underline the costs of relationship lending (e.g. Sharpe, 1990; Rajan, 1992; Weinstein and Yafeh, 1998). Indeed, thanks to its informational advantage, the bank might

extract surplus from the borrowing firms. This could change the incentives for the firms. Firms could prefer to apply for credit at a transactional financier, who will have neither the advantages nor the costs of entertaining the relationship with the bank.

Some empirical research has tried to test those results derived from the theoretical models. In particular, many papers have analyzed – in various countries – the impact relationship lending has on the financing of the SMEs. For the US, various studies used data from the National Survey of Small Business Finance. Among these studies, Petersen and Rajan (1994) find that the firms obtaining loans from fewer banks enjoy easier access to credit and pay lower borrowing rates, while longer firm-bank relationships translate into increased availability of financing. Berger and Udell (1995) show that a longer firm-bank relationship lowers the cost of credit and reduces also the requirements of collateral guarantees. On data for Italy, Angelini et al. (1998) find that the intensity of relationship lending reduces the probability that borrowing firms will be rationed, even though the lending rates charged by the banks tend to increase as the firm-bank relationship lengthens. For Belgian enterprises, Degryse and Van Cayseele (2000) detect the impact relationship lending along two different dimensions: borrowing rates increase as the firm-bank relationship lengthens, while borrowing rates decrease when the scope of the firm-bank relationship, defined as the purchase of additional information intensive services (other than the loan), increases.

Differently from what happened with the great attention for relationship lending, the literature has been rather silent about the determinants and the features of the transaction lending technology. Often, the literature has used the transaction lending label for any type of loan based on information that is easily verifiable by anybody, where the release of such information is typical of the most transparent enterprises. Berger and Udell (2006) criticize this over-simplification. In particular, they suggest that there are various technologies hinging on "hard" information, and these technologies do differ among themselves. This has relevant policy implications. To exemplify, referring to the simplified dichotomization between relationship lending and transaction lending, a number of authors have argued that the large banks are at a disadvantage in supplying funds to the more opaque SMEs.[2] However, Berger and Udell (2006) underline that many large banks lend to opaque SMEs by means of transaction lending technologies, thereby dealing with informational asymmetries by means of "hard" information. In fact, where no detailed and trustworthy financial accounts are available, the large banks may often use other "hard" type information to assess the probability that the enterprise will repay the loans it was granted.[3] de la Torre et al. (2010) find evidence consistent with these arguments. They show that SMEs emerge as a strategic sector for most banks, including large and foreign banks. In fact, banks are increasing applying to SME financing different transactional technologies that facilitate arm's-length lending. Uchida et al. (2006) tested the importance of the various lending technologies proposed by Berger and Udell (2006). Their result suggests that the banks, even though possibly employing mainly some specific criteria to lend, tend to use the various lending technologies at the same time. Using Italian data, Murro (2010) obtains similar results. These results confirm that the same firm tends to receive credit via different lending technologies. However, an additional finding in Bartoli et al. (2010) shows that the soft information variable lowers (raises) the probability of rationing if the firm's main bank uses relationship (transactional) lending technologies. Thus, it appears that the way the soft information becomes embodied in the lending decision might still differ between relational vs. transactional banks/technologies.

3 Theoretical Predictions

3.1 Information and Credit Rationing

Why do we expect that the likelihood of rationing increases when the bank type perceived (ex ante) by the firm as optimal in selecting its main bank turns out not to be satisfied ex post by the bank

[2] For a survey of the literature on this theme, see, e.g., Boot (2000), Ongena and Smith (2000), and Elyasani and Goldberg (2004).

[3] For example, with highly asset-based enterprises the large banks can employ an assessment of the assets pledged as collateral guarantees; with factoring companies they can focus on the quality of the loans purchased by those companies; for leasing companies the large banks can use an evaluation of the fixed assets owned by the companies.

actually selected? To answer this question, it is important to remind the main determinants of credit rationing. The literature (see, e.g., Jaffee and Stiglitz, 1989) underlines that credit markets differ from standard markets in one principal aspect: the latter markets involve a number of agents that are buying or selling a homogenous commodity, in contrast, credit (in money or goods) received today by an individual or firm is exchanged for a "promise" of repayment (in money or goods) in the future. The problem is that a specific individual's "promise" is not as good as that made by another individual and there may be no objective way to determine the likelihood that the "promise" will be kept. As we outlined in the previous section, moral hazard and adverse selection may affect the likelihood of loan repayment. As mentioned, though asymmetric information and incentive (principal-agent) problems may lead credit rationing to persist in equilibrium (see, e.g., Jaffee and Russell, 1976; Stiglitz and Weiss, 1981), some authors papers (see, e.g., Diamond, 1984; Rajan, 1992; Bhattacharya and Thakor, 1993) suggest that banks, through adequate screening and monitoring procedures, can overcome the asymmetric information and incentive problems and, thus, reduce enterprises liquidity constraints. Thus the (production and use of) information is crucial for the impact of the relations between the bank and the firm on credit rationing.

The specific characteristics of banks and firms may affect the role of information in the loan contract. In general, the literature underlines that there are various types of banks and firms. Banks typically offer two very different types of credit to their corporate customers: at one extreme, loans characterized by – tough to compete away – inside information and, at the other extreme, arm's-length debt for which banks compete on a much more equal informational footing (see, e.g., Broecker, 1990; Inderst and Mueller, 2006; Hauswald and Marquez, 2006). At the same time, most authors concur it is useful to distinguish the firms on the basis of the intensity of their information opacity. This sometimes corresponds to separating large-sized (relatively transparent) enterprises from smaller and medium-sized (relatively opaque) ones. Indeed, several papers stress that the SMEs can suffer more intense credit rationing because of their higher opacity (see, e.g., Berger and Udell, 2006; Beck et al., 2008). Obviously, firm size is not the only way to approximate opacity. Some authors discriminate the firms on the basis of whether their statements are audited and/or they offer real assets as collateral guarantees on the loans they obtain (see, e.g., Berger and Frame, 2007; Klapper, 2006). The existence of an optimal match between bank type and enterprise type is often posited. For example, some papers stress that the large banks hold a comparative advantage in transactional lending based on "hard" information to transparent firms (see, e.g, Stein, 2002; Berger et al., 2005), while the smaller-sized or local banks have an edge in relationship lending based on "soft" information to opaque firms (Berger and Udell, 2002; Presbitero and Zazzaro, 2011). Under this classification, the "optimal couples" are opaque firms/relationship banks and transparent firms/transactional banks. The chosen mode of bank-borrower interaction should therefore affect the loan transactions (and so the likelihood of credit rationing) through the nature of the disclosed information, public vs. private and "hard" vs. "soft", and the lender's ability to benefit from it (Petersen, 2004). Even though the two couples above are optimal in theory, in reality we should contemplate the possibility that not always the agents reach the appropriate matching, and these imperfect matches will influence the credit availability.

3.2 Causes and Effects of the "Odd Couples"

The reader may wonder why is possible a mismatch between the bank type perceived (ex ante) by the firm as optimal and the characteristics of the actual main bank. We posit this mismatch is due to two chief causes. First, an explanation of the "odd couples" is the presence of double-sided information asymmetry. As in the previous literature, the bank does not know exactly the type of the borrowing applicant. However, in addition to that, also the enterprise knows only imperfectly which bank type it is selecting. In other words, it could be difficult for outsiders to tell apart relationship lenders from transactional lenders if this is an intrinsic feature depending on internal organization/technology choices that are hardly visible from the exterior.[4] A second reason is the strategic behavior of worse

[4] Moreover, as the objective of the bank is to maximize the number of good firms in their borrowing pool and the bank is unable to perfectly identify ex-ante the quality of the new firms applying for credit, the bank may have an incentive to not disclose its type. In fact, the bank may have an incentive to maximize its number of customers. Only later on, will the bank try to discriminate among the various customers by means of its vocational lending technology.

firms (in term of riskiness). These firms, anticipate the lender's strategic use of information and self select into arm's-length debt expecting they will be less likely discovered as bad risks by a transactional lender while a relationship bank would raise that likelihood. This strategic behavior increases the probability of mismatch.

About the possible effects of an "odd couple", we must understand how the combinations between the disclosed information and the lender's ability to benefit from it, affect the probability of rationing. In a context in which the relevant information is difficult to verify, more opaque firms, searching for a relationship bank, signal their willingness to disclose confidential information and assist in the lenders' effort to gather proprietary intelligence necessary for inside debt. Relationship lending applications impose costs on firms in terms of not only time and effort but also informational capture (e.g., Rajan, 1992) and spillovers (Bhattarcharya and Chiesa, 1995) from the revelation of privileged information. At the same time, the lender follows up on such intelligence by verifying and interpreting it, which amounts to costly information certification. Hence, one can view the decision to disclose confidential information through relationship lending as the attempt by borrowers to provide a certified signal of creditworthiness in line with Okuno-Fujiwara et al. (1990) and Shavell (1994). But, if the bank is unable (or unwilling) to verify this information, the firm may be rationed. By contrast, searching for a transactional bank, borrowers communicate their reluctance to share confidential information with the bank. The are two main possible reasons for this behavior. First, a firm, transparent and good (in terms of less riskiness), interacts with an arm's-length bank because it is less onerous in terms of direct and future indirect costs (informational capture and spillovers). Second, worse credit risk firms may strategically self select into arm's-length debt to decrease the probability of rationing. However, some of these strategically motivated self selections will be unveiled also by the transactional lenders. In this case, indeed, the second type of firms – that self select into an "odd couple" of the type opaque firm/transactional bank – may be more likely rationed.

Finally, we can ask why rationing persist over time. In fact, if the capital market was perfect, the odd firm-bank couples would have no consequence in the long-run. When the firm realizes it has ended up with the "wrong" type of bank it could migrate to a more adequate bank. However, because of the existence of switching costs, more often than not the firm will be stuck in its relationship with the inadequate bank, continuing to suffer heightened credit rationing. Several arguments predict that switching costs might affect bank-firm relationships. For example, there exist information costs generated by switching to a new bank that use specific rules and practices in its lending activity different than rules adopted by the old bank. Moreover, there are transaction costs of closing the accounts with the current lender and opening new ones with another bank (Barone et al., 2011). Finally, switching costs are very relevant for the investment in setting up a close tie with a bank. Changing the main bank implicate the loss of many benefits such as intertemporal smoothing, enhancement of borrower's project payoffs, and more efficient decisions in case of financial distress (Boot, 2000).

4 Data and Empirical Strategy

4.1 The Empirical Model

In our analysis, we will test whether inconsistency between the ex ante banking needs of the enterprise and the ex post lending specialization of its main bank, i.e. being an "odd couple", affects the probability that the firm will suffer credit rationing. To test our hypothesis we will start building an empirical model of the probability that firms are rationed in the credit market. Denote y_1^* the amount of credit the firm would wish to obtain and y_2^* the size of the loan actually granted by the bank, we have that the firm is rationed any time $y^* = (y_1^* - y_2^*) > 0$. Thus, we can model the probability of rationing as:

$$y = \begin{cases} 1 & \text{if } y^* > 0 \\ 0 & otherwise \end{cases} \tag{1}$$

$$y^* = xa_1 + z_1 d_{11} + u_1, \tag{2}$$

where y is our measure of credit rationing (a dummy variable taking value one if the firm is rationed and zero otherwise), x is a proxy of the inconsistency of the firm's bank type with respect to the firm's stated needs, z_1 is a vector of control variables, and u_1 is the residual.

Usually, a_1 is interpreted as the impact of x on rationing. However, here it is possible that the inconsistency of the firm's bank type is endogenous with respect to the ex ante probability that the firm will be rationed. The possible endogeneity is due to strategic behavior of risky and opaque firms that could have an incentive trying to pretend they are transparent and searching a transactional banking partner. This conduct may affect the probability of rationing. It is essentially for this reason that we estimated our model also with a two-stage approach. Namely, we define z_2 as a vector of instrumental variables, which are correlated with the inconsistency but affect the probability of rationing only through the impact they have on the inconsistency. The impact of these variables on x is captured by the vector d_{22} in the "inconsistency equation"

$$x = z_1 d_{21} + z_2 d_{22} + u_2, \tag{3}$$

where z_1 refers to the control variables included in (2), z_2 is the vector of instruments, and u_2 is the residual. We estimate the IV model using a two stage least squares (2SLS) and a two-stage conditional maximum likelihood (2SCML). OLS and maximum likelihood probit estimation results are also reported.

4.2 Data Description

Our main data source is the Tenth Survey on Italian Manufacturing Firms (SIMF), run by the UniCredit banking group in 2007. Every three years this survey gathers data on a sample of Italian manufacturing firms having more than 10 employees. The 2007 wave consists of 5,137 enterprises. All the firms with more than 500 employees are included, while those having a number of employees in the range 11 to 500 are sampled according to a stratified selection procedure based on their size, sector, and geographic localization. The main strength of this database depends on the very detailed information it collects on individual firms. In particular, the 2007 wave featured information regarding the firm's: a) ownership structure; b) number and skill degree of employees; c) attitude to invest in R&D and whether it has made innovations; d) extent of internationalization and export; e) quality of the financial management and relationships with the banking system. This information is gathered through a survey on the three years previous to the survey year (thus, for the wave we use data go from 2004 to 2006). The firms in the sample cover approximately 9% of the reference universe in terms of employees and 10% in terms of value added. Thanks to its stratification, the sample is highly representative of the economic structure of Italian manufacturing. Table 1 displays summary statistics. The surveyed firms have been in business on average 22 years; 60% of the firms have fewer than 50 employees (less than 4% of the firms have more than 500 employees); 70% are based in the North. Only 1% are listed in the Stock Exchange, while 37% have their balance sheet certified by external auditors. As to sector specialization, almost half of the enterprises belong to traditional sectors, according to Pavitt's taxonomy (Pavitt, 1984), while only 5% have their business in the high tech sectors. Moving on to their financial set up, the average length of the relationship with the main bank is 17 years; 48% of the firms have a national banks as their main banking partner, 10% entrust a *banca popolare* (larger-sized cooperative banks), 7% feature a savings bank as their main bank, 5% entrust a *banca di credito cooperativo* (smaller-sized mutual cooperative banks), while 28% of the firms have another type of bank as their main bank. Finally, there is extensive multiple banking: on average firms have five banks and the share of loans obtained from the main bank is 32% of the total bank loans received.

Particularly relevant for our analysis, the 2007 wave of the survey featured a peculiarity with respect to the previous waves. Specifically, an entirely new set of questions was introduced[5] expressly tailored to investigate in depth the relationship between the firm and its main bank. In this paper

[5] These questions are partly inspired by an analogous detailed survey on SME financing runs in Japan, (see, Uchida et al., 2012).

we will particularly focus on two questions where the firm was asked to state which of the characteristics, choosing from a given list, where important in the firm's selection of its main bank, as well as stating which characteristics, in the firm's view, best describe the way its main bank grants credit. Unsurprisingly, given the fact that this section of the survey required dedication, only one third of the total number of surveyed enterprises (exactly 1,541 firms) answered these questions. Table 2 reports summary statistics for this sub-sample of enterprises.

For the analysis we also use data from other sources (see Table A for details on the variables). We employ data made available by the Bank of Italy on the presence of banks in local markets and data provided by the Italian National Statistics Office (ISTAT) on the value added and population of provinces.

4.3 Credit Rationing

An agent is said to be rationed if he demands more credit than he can obtain on the market, at the going lending rate as appropriate to his risk class. The extent of credit rationing might be measured as the (positive) gap between the marginal return of the enterprise on its capital investment and the going market lending rate applicable to that firm. In practice, however, direct measures of credit rationing are unobservable. For this reason, the empirical literature on credit rationing has employed a large range of rationing proxies. Among the early influential contributions, Fazzari et al. (1988) group the enterprises in their sample on the basis of the firms' dividend policy. They hold that the enterprises retaining a larger fraction of profits as non distributed earnings are the most likely rationed – alternatively, the sensitivity of investment to cash flow is higher for these firms. Berger and Udell (1992) employ the share of the new loans as an indicator of liquidity constraints, given that, if credit rationing is extensive, this share should increase during times of credit squeeze. Petersen and Rajan (1994) note that the credit constrained firms are willing to pay higher costs to increase the amount of credit. Accordingly, they hold credit constrained all the enterprises using non-institutional finance – e.g. trade credit – charging above the market rate. Korajczyk and Levy (2003) use a high retention rate, combined with the existence of investment opportunities, to identify financially constrained firms. Since dividends and security repurchases compete with investment for funds, firms that have investment opportunities and face relatively high costs of external finance should choose to retain net income for investment. At the same time, Kaplan and Zingales (1997) criticized the methodology used by Fazzari et al. (1988) showing that firms that appear less financially constrained exhibit significantly greater sensitivities than firms that appear more financially constrained. For this reason they argue that higher investment-cash flow sensitivities cannot be interpreted as evidence that firms are more financially constrained.

All these indices are indirect indicators and suffer some drawbacks. The main problem with these indicators is that it is impossible to validate the assumption that the variable selected as a proxy of rationing is appropriate. Furthermore, regardless of how good these proxies are, they may reflect other effects that have little or nothing to do with liquidity constraints. This is the essential reason we will employ a direct measure of credit rationing. The idea of this method is to directly ask borrowers whether they would have liked to borrow more at the prevailing interest rate. In case of a positive answer, respondents are classified as credit constrained. The same applies to non-borrowers who respond that they could not get credit although they liked to. The methodology of direct measurement of rationing has been extensively used in the literature. For example, Jappelli (1990), uses a direct measure of credit constraint to analyze the characteristics of credit constrained households in the U.S. economy. Minetti and Zhu (2011), using the same survey (and methodology) employed in this paper, estimated the impact of credit rationing on Italian firms' export.

Our measure of credit rationing is based on firms' responses to the question "In 2006, would your firm have liked to obtain more credit at the market interest rate?". We build a dummy variable taking value one if the firm replies yes, and zero otherwise. In the case of positive answers, two additional questions are asked: "In 2006, did the firm demand more credit than it actually obtained?" and "To obtain more credit, were you willing to pay a higher interest rate?". Using the answers to these questions we perform some robustness checks of our results. Indeed, the logic behind these two

questions is sometimes used to come up with a strong definition of credit rationing. In practice, we build a new dummy variable equal to one when the firm has answered yes to at least one of the two additional rationing questions, zero otherwise. Alas, as Table 1 and Table 2 show, this variable has only few observations. This endangers our control.

4.4 "Odd Couples"

Our key explanatory variable is the inconsistency between the ex ante banking needs of the enterprise and the ex post lending specialization of its main bank. To distinguish the enterprises on the basis of the needs they perceive in choosing their main banks, and the banks according to the lending criteria they actually use – in the firms' perception –, we employed two questions from the Survey (details for these questions are reported in the Appendix). Using the information obtained from the answers to these two questions we could dichotomize the firms – depending on their ex ante selection drivers – between the group of those searching a main bank more oriented to soft information and relationship lending and the group of those firms looking for efficiency at transactional lending focused main banks. Furthermore, we were also able to dichotomize the main banks – following the ex post assessment based on the firms' perception – between the group of those with a vocation to relationship lending and the group of the banks more inclined to transactional lending. Having completed the bipartition of the firms and of the banks, we could then build four indicators mapping all the possible combinations between firm type and bank type.

The distinction between the two firm types derives from inspecting the answers to the question "Which of these characteristics are key in selecting your main bank?". In answering this question the firm was required to give a weight (going, in descending order, from 1, very much, to 4, nil) to forteen characteristics. Six (from 1 to 6) of the forteen characteristics emphasize the relationship motive, while most of the others (from 7 to 12 and also 14) stress the efficiency reason. In practice, we constructed dummy variables that take the value of one if the firm answered 1 (very much) to the respective characteristic, zero otherwise. Next, we calculated two indices (an index of relationship and an index of efficiency), as the first principal component obtained via the principal component analysis on these dummy variables. The enterprises that turned out having a relationship index larger than their efficiency index were classified as relational, the other firms (those having an efficiency index larger than their relationship index) were cataloged as transactional. Using instead the answers to the question "In your view, which criteria does your bank follow in granting loans to you?", we classified the characteristics of the banks, according to the firms' opinion. Also here the firm was asked to give a weight on the relevance of fifteen criteria, that we could group as relational (criteria from 9 to 11 and from 13 to 15) and transactional (from 1 to 6). Following a procedure entirely analogous to that utilized before in categorizing the firms, we built two bank type indices. The banks that turned out to have a larger value for the relational index were classified relational, the other ones were labeled transactional. Having dichotomized also the banks, we could then build four dummy variables mapping all the possible combinations: relational firm with relational bank; relational firm with transactional bank; transactional firm with relational bank; transactional firm with transactional bank.

This methodology to construct the indicators of consistency between the enterprise's ex ante needs and the ex post characteristics of the bank has some advantages. Primarily, we manage to perceive the actual features of the bank (in the firm's view) at the time the firm is asked. Thus, we can identify the possible differences between the characteristics the enterprise was looking for at the beginning of the business rapport with the bank and those the bank has turned out to actually offer the firm. An additional advantage of our index method is that, though based on the firm's perception, these indices are derived indirectly on the firm's answers. In doing so, we lower the possible distortion of the indices that could descend from the imperfect understanding of the questions. An important feature of our indices – something to keep in mind when explaining the results – is that the firms are divided on the basis of the needs they state in motivating their main bank selection and not on the basis of the enterprises' actual degree of opacity. As such, a good guess is that the firms stating they are searching for a relationship bank are the firms we identified as opaque firms of good quality, while it would be

rational for the opaque enterprises that perceive themselves as risky to look for a transactional bank (see, e.g., Agarwal and Hauswald, 2009).

Table 3 presents the descriptive statistics for these variables. 66% of the firms fall into the combination relational firm with relational bank. The odd couples are 26% of the enterprises as they end up in a sub-optimal matching: 13% of the firms looking for a relational bank has ended up with a transactional bank and an additional 13% of the firms were searching for a transactional bank and have found themselves with a relational main bank. Finally, only 8% of the enterprises were aiming at a transactional bank and have effectively liaised with a transactional bank. To control whether the results we obtained through these indices were only due to the respondents' misinterpretation of the question on the criteria used by the bank in supplying its credit, we can consider the type of bank the firm applies to. We build here on the reasoning put forth by Stein (2002). Specifically, he argues that, in view of their organizational features, the larger banks suffer a disadvantage to offer loans based on soft information to the smaller-sized firms. Because of this, we expect that larger banks tend to supply credit on the basis of transactional type lending technologies, whereas local (typically smaller) banks are expected to use relationship lending technologies. The survey gives us the information on the type of main bank entrusted by the firm.[6] Through this information we will try to replicate the mismatching indices, substituting the type of bank to the firm's answers as to the criteria used by its main bank to supply credit. In this, we coded *Local* banks the cooperative banks, the savings banks and the mutual banks,[7] while categorizing as *National* both the national banks and the foreign banks. Table 4 reports the results that are broadly consistent with expectations: while the share of firms looking for a relational main banking partner is slightly twisted in favor of the Local (44% against 40% for the National) the opposite attains for the share of enterprises looking for a transactional main bank (10% for the National and 6% for the Local). In addition, Table 5 shows that the mismatch phenomenon is much more widespread for the National (23% of the firms with a national main bank end up in an odd couple) than for the local (only 8% are mismatched). Possibly, this depends on the variety among the various National banks. On this, Albareto et al. (2008) argue that, in the recent years, Italy's banking market has seen increasing diversity among the large banks in terms of organizational models.[8] These considerations provide ground for the "reverse" asymmetry of information, whereby a firm can guess only imperfectly the actual lending technology the bank it is approaching.

4.5 Instruments

We have to address the possibility that the event of inconsistency between the ex ante banking needs of the enterprise and the ex post lending specialization of its main bank, on one hand, and the event of credit rationing, on the other, are jointly determined and that unobserved variables are correlated with both events. For these reasons, we use a two-stage approach in our regressions. To implement this empirical model we need an appropriate set of instruments for our measure of inconsistency. The strategy that we adopt is identifying shocks to the local supply of banking services. We expect these shocks to directly influence the probability of a good matching between the ex ante banking needs of the enterprise and the ex post lending specialization of its main bank, but not directly the probability of credit rationing. For example, suppose that a bank opens new branches in the local market. A firm might choose that bank as its new main lender to exploit the advantages of closeness or the hours of operation of its new branches. Indeed, the other banks present in the local market could choose to strengthen their relationships with their customary borrowers and let the newly created branches erode only their portfolio of transactional loans. Hence, the opening of new branches in the local market and the consequent change in the structure of the market, could reduce the quality of firms' perception about the characteristics of the banks and increase the probability of mismatch.

[6] In effect, only 944 – of the 1541 enterprises responding to the two questions we used to build our indices – reported also the type of their main bank. We can imagine some self selection, where the firms unable to specify their type of main bank are those suffering more asymmetries of information on bank characteristics. This conjecture is supported observing that the degree of mismatch is smaller for the 944 firms (15%) than for the 1541 firms (25%).

[7] We code as local banks also the firms that classified their main bank as "other credit intermediary".

[8] This is likely due to various factors: the increasing use of ICT, allowing increasing mobility of the branch managers; the increasingly frequent bank M&A and restructuring since the 1990s; the heightened degree of competition in banking, leading some of the large banks to entrust much autonomy to their branches.

Following Herrera and Minetti (2007), as instruments we use the average number of branches in the province (per 1,000 inhabitants), the annual number of branches (per 1,000 inhabitants) created by incumbent banks net of branches closed and the annual number of branches (per 1,000 inhabitants) created by entrant banks in the province where the firm is headquartered. Unlike Herrera and Minetti (2007), we impute these variables as the average in 1991-2004 (and not as the average in 1991-1998). To understand the choice of these instruments, we have to discuss the Italian banking regulation. In 1936 the government approved strict entry regulation that virtually froze Italy's banking structure for several decades. For example, between 1936 and the late 1980s in Italy the number of bank branches grew less than 90% (versus more than 1200% in the United States). In the late 1980s the geographical restrictions on lending were eased and the procedure for opening new branches was relaxed. Finally, any form of restriction was lifted during the 1990s.[9] The creation and location of new branches, as determined by the progressive removal during the 1990s of the 1936 regulation, impacted directly banks' potential to open new branches in the local markets besides the location of branches. Thus, we expect that the number of branches created helps capture the local shock induced by the removal of the regulation.

In addition to the above variables, we include in our set of instruments a measure of banks' organizational stability. In particular, we use the average branch manager turnover in the province where the firm is headquartered, measured over 1985-1992. This measure of bank' (lack of) stability, affecting the probability of an unexpected change in the lending specialization of the banks, could impact the likelihood of "odd couples", but is unlikely to have a direct impact on the probability of credit rationing.

4.6 Control Variables

We now discuss the other variables included in the regressions. The control variables we use may be grouped into three clusters: those referring to the firm's features, those measuring the firm-bank(s) relationship, and those relating to characteristics external to the firm. Among the firm's features, we will firstly control for those associated with the information opaqueness of the enterprise. In practice, we include a dummy variable which is one if the firm has its financial statement certified by external auditors. This is a key feature in our analysis since it provides us with a direct measure of the firm's extent of informational opaqueness. In fact, the "hard" information, when coming from audited statements, makes the firm more transparent for the banks, allowing also the efficient use of lending technologies based on accounting information only (Berger et al., 2005). Other factors that could proxy the enterprise's opaqueness are its age and size. In fact, young firms are less informationally transparent than older ones because they lack an established track record (Guiso and Minetti, 2010). We include the natural logarithm of age, where the age of the firm is measured from the firm's inception. Small firms are also thought to be less informationally transparent than larger ones because they are not monitored by the financial press (Petersen and Rajan, 1994; Berger and Udell, 1998). We measure size by the logarithm of the number of employees (results with total assets are virtually identical). Moreover, we include a variable indicating whether the firm is a public limited company. Finally, among the firm's features we consider two basic performance indicators: leverage and return. A higher degree of financial leverage, given by the ratio of total liabilities to the sum of the total liabilities and the firm's assets, points to more intense firm risk and, so, it will likely raise the likelihood the company is rationed (Jensen and Meckling, 1976). On the opposite, we expect firms enjoying higher returns (as measured by return on assets, given by the ratio of operating profits to total assets) to be less likely rationed for credit.

As to the variables addressing the enterprise's relationship with the banks, we insert the specific ones measuring the intensity of the relationship with the main bank. This can be measured directly thanks to some variables. Specifically, we consider the share of loans obtained from the main bank on the total bank loans received by the firm; the length of the relationship, measured by (logarithm of)

[9] Angelini and Cetorelli (2003) find evidence that banking deregulation in Italy during 1990s deeply affects local credit markets. They suggest that mergers and acquisitions have mainly improved banks' efficiency and that such improvements have at least in part been passed on to customers.

the number of years the firm has being doing business with its current main bank. Higher percentages of loans provided by the main bank and longer durations of the credit relationship are regarded by the literature as good indicators of a strong rapport. A bank can accumulate information over time by observing the firm's compliance to its contractual obligations and covenants (Petersen and Rajan, 1994). The impact of the duration of the credit relationship is studied in Petersen and Rajan (1994, 1995), Berger and Udell (1995), Ongena and Smith (2001) and Herrera and Minetti (2007), among others. This literature finds evidence that long-term relationships increase credit availability (Petersen and Rajan, 1994, 1995) and reduce funding costs (Berger and Udell, 1995). This corroborates the view that the length of the relationship is a good proxy for its strength. We also introduce a variable interacting between the percentage of loan provided by the main bank and the length of its relationship, and the number of banks with which the firm does business stably, to capture the incidence of a possible moral hazard (hold-up) by the lender (Rajan, 1992; Petersen and Rajan, 1994). In addition, as an indirect measure of the firm's relationship with its main bank, we also introduce a dummy variable taking value one if the firm's main bank did not change its credit officer over the previous five years. Theory suggests that banks can avoid diluting soft information by delegating lending authority to the same agent that collects it, the loan officer (e.g., Stein, 2002; Berger and Udell, 2002; Liberti and Mian, 2009). We also take into account the official classification of the main bank introducing in our regressions a dummy variable, that takes value one if the main bank is either a saving bank, or a cooperative bank, or a mutual bank, and zero otherwise. Angelini et al. (1998) show a significant role of the mutual cooperative banks on firms' cost and availability of credit in the Italian context. To conclude, we control for the firm's geographical localization. In particular, we code dummies for whether a firm is located in the Center or in the South of Italy. We also include sector dummies according to two-digit SITC classification. Finally, we control for the average growth rate of the value added of the province in 1991-1998, and for the average of the Herfindahl-Hirschman Index on total bank lending in the province from 1990 to 2006. Dinc (2000) and Carbó-Valverde et al. (2009) underline the importance of local credit market competition on banks' behaviour.

5 Results

5.1 "Odd Couples" and credit rationing

Table 6 reports the OLS and probit estimates of the likelihood of credit rationing. We find that the inconsistency between the needs of the enterprise and the characteristics (the lending specialization) of its main bank (i.e. the phenomenon of the "odd couples") increases the likelihood of credit rationing. In the probit estimation (column 2), the coefficient of our measure of inconsistency is 1.023 and is significant at the 1% level (with a z-statistic equal to 6.65). This result is achieved controlling for the firm's opaqueness, as well as for the features of its relationship with the banks.

As discussed earlier, the OLS and the probit estimates are likely to be biased due to the possible endogeneity deriving from the strategic behavior of "risky" and opaque firms. In fact, as these firms could have an incentive trying to pretend they are transparent and searching a transactional banking partner, this conduct may affect the probability of rationing. To control for the possible endogeneity between credit rationing and the mismatch of firm type versus main bank type we estimate the model through a two-stage approach. Table 8 reports the results of IV estimation using 2SLS on the linear probability model and 2SCML for the probit specification. We report separately the first-stage regression in Table 7. The probability of "odd couples" is increasing in the number of branches created by incumbents over 1991-2004 and in the turnover of the management of the branches in the province, supporting the hypothesis that a lack of stability in local market could positively affect the likelihood of an unexpected change in the lending specialization of the banks. Instead, the probability of mismatch is decreasing in the number of bank branches in the province over 1991-2004 and in the number of branches created by new entrants over the same period. A possible explanation of these results is that a more concentrated local financial market could reduce the switching costs and hence the probability of mismatch. Controlling for exogenous firm, and province level characteristics, we can reject the null that the instruments are jointly insignificant in the inconsistency equation: the

F-statistic is 3.05 with a p-value of 0.016.[10] The p-values of the overidentification tests, reported in Table 8, show that instruments are uncorrelated with the regression residual at standard levels of confidence. Finally, we also report the p-value for a test of exogeneity of our measure of mismatch in the probit estimation. Based on this test, we reject the null hypothesis that the phenomenon of the "odd couples" is exogenous with respect to the probability of credit rationing. Looking at the effect of control variables in the first stage, we find that the length of the lending relationship (with coefficient equal to -0.060 and t-statistic equal to -2.81) and the share of loans obtained from the main bank (with coefficient equal to -0.002 and t-statistic equal to -1.90) reduce the probability of mismatch. Instead, the interaction between these variables (that might isolate the lock-in effect) is associated with higher probability of "odd-couples", with a coefficient equal to 0.045.

In Table 8, we report the results of the second-stage of the IV estimation. Henceforth, we provide comments on the 2SCML estimates; the 2SLS estimates are qualitatively similar. The results do not qualitatively differ from those obtained without instrumenting. The positive impact on credit rationing is large (with coefficient equal to 3.048) and significant (with z-statistic equal to 12.13). The effect of "odd-couples" on credit rationing is economically sizable, especially when compared to the effect of control variables such as firm characteristics or local market conditions.

The results for the firm-specific control variables are generally consistent with the findings of the empirical literature on the determinants of credit rationing. As regards the firm's informational opaqueness, we find that firm size is significant (though only in the 2SLS estimate) and it is associated with lower probability of rationing (coefficient equal to -0.033 in the 2SLS estimate). Instead, the other variables aimed to capture the firm's informational opaqueness are not significant. Regarding the variables capturing credit conditions and the relationships with banks, we find that a stronger relationship with the main bank lowers the probability of rationing. In fact, we detect a negative (coefficient equal to -0.331 and significant at the 5% level) effect for the stability (lack of turnover) of the main bank's credit officer. Furthermore, in line with the result just outlined, there is an additional evidence of a positive (coefficient equal to 0.037) and significant (at the 5% level) effect of the number of banks among which the firm splits its overall relationship with the banking system on credit rationing. In fact, the literature suggests that the extent of multiple bank lowers the intensity of the firm's relationship with its main bank (see, e.g, Ongena and Smith, 2001). Instead, perhaps surprisingly, the coefficient on the length of the firm's relationship with the main bank is statistically insignificant. A separate issue regards the type of bank engaged as the firm's main bank. The results show that having a Local bank as the main bank increases the probability of credit rationing. Regarding the variables controlling for the characteristics of the environment in which the firms operate, we find that almost none of the included variables is significant.

5.2 Robustness checks

In Table 9 we show the results of a robustness check using as dependent variable a dummy equal to one if the weakly rationed firm has answered yes also to at least one of the two additional rationing questions (whether the firm did apply for credit without getting it and whether it was willing to pay a higher loan rate), zero otherwise. We find that in this specification almost all the independent variables lose their explanatory power. This outcome likely descends from the paucity of observations.

In Tables 10 and 11, we report the results from running the regressions for credit rationing on subsamples of observations. As the mismatch cases are more widespread for the firms with a National bank as a main bank, in Table 10 we split the sample depending on the main bank type, to control the robustness of our findings. The results corroborate our previous findings. For the firms with a National main bank, the impact of "odd-couples" is positive and significant (coefficient equal to 2.728 and significant at the 1% level). Indeed, the impact of mismatch is positive (coefficient equal to 4.056 and significant at the 1% level) also for the firms with a Local main bank. The results for the relationship length and turnover of the credit manager appear to be very interesting. In fact, when

[10] The p-values for the individual coefficients are: for the number of total branches, 0.065; for the number of branches created by incumbent banks, 0.032; for the number of branches created by external banks, 0.011; and for the turnover of bank's management, 0.048. Note that an F-statistic of 3.05 could signal that we have a weak instruments problem (see, e.g., Stock and Yogo, 2003, for more on these issues) and our estimates could be biased toward their OLS counterparts.

the firm has a Local bank as main bank, its relationship length significantly lowers the probability of rationing (coefficient equal to -0.310), while the turnover of the credit manager is not significant. Instead, when the main bank is a National bank, the results are opposite (although turnover is significant only for 2SLS). These results suggest a different use of information, and in particular of soft information, between National and Local banks. Namely, the role of the credit manager seems less relevant for the Local main banks, apparently in contrast with the theoretical literature. Stein (2002) and Berger et al. (2005) hold that large banks suffer a disadvantage in producing soft information and that credit managers play a minor role in these banks.[11] Instead, our results seem to suggest that the role of soft information is essential in both bank types. However, the use of soft information is detached from the credit manager for the Local banks, perhaps able to capture soft information through their engagement in the local community; while the lack of turnover of the credit manager appears key for the use of soft information at National banks.

The reader may wonder whether the impact of the mismatch could actually differ between the more transparent and the more opaque enterprises. In fact, it is possible that, irrespectively of the type of main bank, the firms with lower informational opaqueness are less likely rationed. Following Berger and Udell (2006), we consider as a proxy of transparent firms whether the borrower has audited financial statements. In Table 11 we control the impact of the mismatch for these firms. The findings show that the effect of mismatch on credit rationing does not change. The estimated effect of inconsistency is positive (coefficient equal to 2.550) and significant (z=7.69). These results confirm the predictions that the impact exerted by the mismatch on the likelihood of credit rationing go beyond the problems of the enterprises' informational asymmetry.

5.3 Lending Relationship Length

One of the hypotheses we put forward is that the impact of the problems of being an odd couple is stronger for those enterprises with longer-lasting banking relationships. In fact, the literature (see, e.g., Rajan, 1992) underlines that the length of the lending relationship with the main bank increases the switching costs. In addition, the fact that both the firm's needs and the bank's characteristics might evolve over time makes the longer-lasting relationship more likely mismatched (in line with Ongena and Smith, 2001, we can expect that the value of relationships declines over time). To test this differential effect, we split the sample into two sub-samples of observations, with respect to the median value of the length of the main bank-firm relationship. The results are supportive of our hypothesis (Table 12). The impact of the mismatch on the likelihood of credit rationing is still positive and significant (at the 1% level) only for the firms with longer bank relationships. For the firms with shorter relationships the effect is negative, but lower and insignificant.

Interestingly, for the enterprises having longer-lasting bank relationships we detect a change in the sign of the relationship length. While in the whole sample – and also for the firms with shorter bank relationships – the length of the relationship reduces the probability of rationing, the opposite holds for the enterprises with longer bank relationships. Instead, for the enterprises having shorter bank relationships we find that the interaction between the relationship length and the main bank's share over total bank loans is associated with a higher probability of rationing. Thus, even though the direct impact of longer-lasting relationships still lowers the probability of rationing, this impact is weakened by the interaction term. The interaction might, in fact, single out the firms "stuck" in their relationship with the main bank.

5.4 Type of Mismatch

We might expect that the impact on rationing of the firm-bank mismatch depends on the type of odd couple. As discussed in Section 3, the reasons why an odd couple can hinder the firms' credit availability should differ depending on the type of mismatch. Table 13 presents the results of two additional estimates. In the first column we consider as a main explanatory variable the relational

[11] Less extreme conclusions are reached by Uchida et al. (2012) showing that the way that loan officers produce soft information is similar across large and small banks.

firm/transactional bank matching. On the opposite, the results in the second column refer to an estimate where we consider as main explanatory variable the mismatch between transactional firms and relational banks. For the 2SCML estimations, the impact of the mismatch is confirmed positive and statistically significant (at the 1% level) in both cases. The coefficients appear to be larger for the transactional firm/relational bank mismatch than for the first type (4.246 against 3.829). This result is not unexpected. As already mentioned in the discussion of the theoretical setup, it is very likely that among the firms stating they are transparent we find worse credit risk firms that anticipate the lender's strategic use of information and try to self select into arm's-length debt. If this is the situation, then the higher probability of rationing for the second type odd couples could simply depend on the fact that the group includes a larger share of risky enterprises.

As a check on the goodness of our hypothesis, we examined the ROA across the two odd couples types. The average ROA in both types of mismatch is equal to 4.4%. However, if we restrict the two sub-samples to the enterprises without an audited statements (where we should single out the more opaque firms) we notice that firms in the transactional firm/relational bank mismatch have a much lower ROA than the others (2.3% vs. 4.1%). This seems to confirm the hypothesis that there is a larger presence of worse credit risk firms among the enterprises in transactional firm/relational bank mismatch.[12]

6 Conclusions

The literature on credit rationing has extensively studied how the credit market equilibrium is affected by the asymmetry of information between the borrowing enterprise and the banking system. Most studies have addressed the problem considering only one direction, namely they have addressed how the firm's opaqueness affects the credit decision outcome. On the contrary, the literature seems to have overlooked the fact that also the bank may to some extent be opaque in the eyes of the potential borrowing enterprise, which could also impact the credit outcome. In a sense, the possibility that this reverse asymmetry of information might play a substantive role seems to follow from the increasing attention a growing strand of literature has given to the fact that banks do differ in terms of the lending technology they specialize in. Next, since it may be hard for outsiders to identify the lending technology actually employed by the bank and the bank might have no incentive to practice complete disclosure about that, it is possible that the enterprises end up with a type of bank different from the one they needed (and they thought they got). We argued this could pose a problem in view of the fact that not all the firm type/main bank type couples are optimal and also because the presence of switching costs could cause some enterprises to stably stay stuck in a suboptimal firm-bank couple, we called these the "odd couples". Alternatively, we conjectured that "odd couples" could emerge because riskier firms – even though opaque – strategically select transactional banks in the hope of being classified as lower risks.

In this paper, we employed a large sample of Italian manufacturing enterprises to test whether ending up in an odd couple raises the probability that a firm will be rationed for credit, as the firm itself reports in the survey. The results support our conjecture. Also, the importance of the switching costs is suggested by the evidence that the enhancing effect on rationing of the odd couples is larger for the enterprises with longer lengths of the credit relationship with their main banks. The above results are attained controlling for various canonical determinants of rationing. A further result of some interest was that, in line with the literature, the probability of rationing is lower for the enterprises holding a more intense relationship with their main bank, as indicated by the length of the relationship, and if there was no turnover of the credit officer at the main bank, while the likelihood of rationing increases for firms splitting their bank rapport among a larger number of banks.

Our evidence might warrant some policy considerations on measures to increase the transparency of the bank as to the lending technology it employs and to lower the switching costs. Such policies

[12] As a robustness check, we restrict our analysis to firms with audited financial statement (i.e. firms actually more trasparent). The findings are in line with our a priori. The coefficients for the types of mismatch are both positive and significant, but now the coefficient for relational firm/transactional bank mismatch is the largest. Results are available upon request.

would help reduce the probability that odd couples ensue and, when they do, that they last. As to future research, our paper suggests developing a theoretical model featuring the specific form of bilateral asymmetry of information could be a promising avenue.

References

[1] Agarwal, S. and Hauswald, R., (2009), "The Choice between Arm's-Length and Inside Debt", *Unpublished working paper,* FRB of Chicago and American University.

[2] Albareto, G., Benvenuti, M., Mocetti, S., Pagnini, M. and Rossi., P., (2008), "L'organizzazione dell'attività creditizia e l'utilizzo di tecniche di scoring nel sistema bancario italiano: risultati di un'indagine campionaria", *Questioni di Economia e Finanza*, No. 12, Bank of Italy.

[3] Angelini, P. and Cetorelli, N., (2003), "Bank competition and regulatory reform: the case of the Italian banking system", *Journal of Money, Credit and Banking*, Vol. 35, 663-684.

[4] Angelini, P., Di Salvo, R. and Ferri, G., (1998), "Availability and cost of credit for small businesses: customer relationships and credit cooperatives", *Journal of Banking and Finance*, Vol. 22 (6-8), 925-54.

[5] Barone, G., Felici, R., Pagnini, M., (2011), "Switching costs in local credit markets", *International Journal of Industrial Organization*, Vol. 29, 694-704.

[6] Bartoli, F., Ferri, G., Murro, P. and Rotondi, Z., (2010), "What's special about banking in Italy? Lending Technologies, Complementarity, and Impact of Soft Information", in G. Bracchi and D. Masciandaro, eds.: The XII Report on Financial System: "Nuovi equilibri in finanza: le banche, le imprese e lo stato", Italian Banking Association.

[7] Beck, T., Demirguc-Kunt, A. and Maksimovic, V., (2008), "Financing patterns around the world: Are small firms different", *Journal of Financial Economics*, Vol. 89, 467-487.

[8] Berger, A.N. and Frame, W.S., (2007), "Small Business Credit Scoring and Credit Availability", *Journal of Small Business Management*, Vol. 45 (1), 5-22.

[9] Berger, A.N., Miller, N.H., Petersen, M.A., Rajan, R.G. and Stein, J.C., (2005), "Does function follow organizational form? Evidence from the lending practices of large and small banks", *Journal of Financial Economics*, Vol. 76 (2), 237–269.

[10] Berger, A.N. and Udell, G.F., (1992), "Some evidence on the empirical significance of credit rationing", *Journal of Political Economy*, Vol. 100, 1047-1077.

[11] Berger, A.N. and Udell, G.F., (1995), "Relationship lending and lines of credit in small firm finance", *Journal of Business*, Vol. 68, 351-81.

[12] Berger, A. N. and Udell, G.F., (1998), "The Economics of Small Business Finance: The Roles of Private Equity and Debt Markets in the Financial Growth Cycle", *Journal of Banking and Finance*, Vol. 22, 613–673.

[13] Berger, A. N. and Udell, G.F., (2002), "Small Business Credit Availability and Relationship Lending: The Importance of Bank Organisational Structure", *Economic Journal*, Vol. 112, F32-F53.

[14] Berger, A. N. and Udell, G.F., (2006), "A more complete conceptual framework for SME finance", *Journal of Banking and Finance*, Vol. 30, 2945–2966.

[15] Bernanke, B.S. and Gertler, M., (1995), "Inside the black box: The credit channel of monetary policy transmission", *Journal of Economic Perspectives*, Vol. 9, 27-48.

[16] Bhattacharya, S. and Chiesa, G., (1995), "Proprietary Information, Financial Intermediation, and Research Incentives", *Journal of Financial Intermediation*, Vol. 4 (4), 328-357.

[17] Bhattacharya, S. and Thakor, A.V., (1993), "Contemporary banking theory", *Journal of Financial Intermediation*, Vol. 3, 2-50.

[18] Boot, A.W.A., (2000), "Relationship banking: what do we know?", *Journal of Financial Intermediation*, Vol. 9 (1), 7–25.

[19] Broecker, T., (1990), "Credit-Worthiness Tests and Interbank Competition", *Econometrica*, Vol. 58 (2), 429-452.

[20] Carbó-Valverde, S., Rodriguez-Fernandez, F. and Udell, G.F., (2009), "Bank market power and sme financing constraints", *Review of Finance*, Vol. 13 (2), 309–340.

[21] Degryse, H. and Van Cayseele, P.J.G., (2000), "Relationship lending within a bank-based system: evidence from European small business data", *Journal of Financial Intermediation*, Vol. 9 (1), 90-109.

[22] de la Torre, A., Martinez Peria, M.S. and Schmukler, S.L., (2010), "Bank involvement with SMEs: Beyond relationship lending", *Journal of Banking and Finance*, Vol. 34, 2280-2293.

[23] Diamond, D.W., (1984), "Financial intermediation and delegated monitoring", *Review of Economic Studies*, Vol. 51, 393-414.

[24] Diamond, D.W., (1991), "Monitoring and reputation: The choice between bank loans and directly placed debt", *Journal of Political Economy*, Vol. 99, 689-721.

[25] Dinc, I.S., (2000), "Bank reputation, bank commitment, and the effects of competition in credit markets", *Review of Financial Studies*, Vol. 13 (5), 781–812.

[26] Elyasani, E. and Goldberg, L.G., (2004), "Relationship lending: A survey of the literature", *Journal of Economics and Business*, Vol. 56, 315-330.

[27] Fazzari, S.M., Hubbard, R.G. and Petersen, B.C., (1988), "Financing constraints and corporate investment", *Brookings Papers on Economic Activity*, Vol. 1, 141-206.

[28] Guiso, L. and Minetti, R., (2010), "The Structure of Multiple Credit Relationships: Evidence from US Firms", *Journal of Money, Credit and Banking*, Vol. 42 (6), 1037-1071.

[29] Hauswald, R. and Marquez, R., (2006), "Competition and Strategic Information Acquisition in Credit Markets", *Review of Financial Studies*, Vol. 19 (3), 967-1000.

[30] Herrera, A. and Minetti, R., (2007), "Informed Finance and Technological Change: Evidence from Credit Relationships", *Journal of Financial Economics*, Vol. 83, 223-269.

[31] Hubbard, R.G. (Ed.), (1990), *Asymmetric Information, Corporate Finance and Investment*. University of Chicago Press, Chicago, IL.

[32] Inderst, R. and Mueller, H., (2006), "Informed lending and security design", *Journal of Finance*, Vol. 61, 2137-2162.

[33] Jaffee, D. and Russell, T., (1976), "Imperfect Information, Uncertainty, and Credit Rationing", *Quarterly Journal of Economics*, Vol. 90 (4), 651-666.

[34] Jaffee, D. and Stiglitz, J.E., (1989), "Credit Rationing", The Macmillan Press Ltd.

[35] Jappelli, T., (1990), "Who is credit constrained in the US economy?", *Quarterly Journal of Economics*, Vol. 105, 219-234.

[36] Jensen, M.C. and Meckling, W.H., (1976), "Theory of the firm: Managerial behavior, agency costs and ownership structure", *Journal of Financial Economics*, Vol. 3 (4), 305-360.

[37] Kaplan, S.N. and Zingales, L., (1997), "Do Investment-Cash Flow Sensitivities Provide Useful Measures of Financing Constraints?", *Quarterly Journal of Economics*, Vol. 112, 169–215.

[38] Klapper, L., (2006), "The role of factoring for financing small and medium enterprises", *Journal of Banking and Finance*, Vol. 30, 3111-3130.

[39] Korajczyk, R.A. and Levy, A., (2003), "Capital structure choice: macroeconomic conditions and financial constraints", *Journal of Financial Economics*, Vol. 68, 75-109.

[40] Liberti, J. and Mian, A., (2009), "Estimating the Effect of Hierarchies on Information Use", *Review of Financial Studies*, Vol. 22, 4057-4090.

[41] Minetti, R. and Zhu, S.C., (2011), "Credit constraints and firm export: Microeconomic evidence from Italy", *Journal of International Economics*, Vol. 83, 109-125.

[42] Murro, P., (2010), "Lending Technologies in Italy: an Example of Hardening of Soft Information", *Rivista Bancaria*, Vol. 4/2010, 7-32.

[43] Okuno-Fujiwara, M., Postlewaite, A. and Suzumura, K., (1990), "Strategic Information Revelation", *Review of Economic Studies*, Vol. 57, 25-47.

[44] Ongena, S. and Smith, D.C., (2000), "Bank relationships: A review". In P.T. Harker and S.A. Zenios, (Ed.), *Performance of Financial Institutions*. Cambridge University Press.

[45] Ongena, S. and Smith, D.C., (2001), "The duration of bank relationships", *Journal of Financial Economics*, Vol. 61, 449-475.

[46] Pavitt, K., (1984), "Sectoral patterns of technical change: Towards a taxonomy and a theory", *Research Policy*, Vol. 13, 343-373.

[47] Petersen, M.A., (2004), "Information: Hard and Soft", *Unpublished working paper*, Northwestern University.

[48] Petersen, M.A. and Rajan, R.G., (1994), "The benefits of lending relationships: evidence from small business data", *Journal of Finance*, Vol. 49, 3-37.

[49] Petersen, M.A. and Rajan, R.G. (1995), "The effect of credit market competition on lending relationships", *Quarterly Journal of Economics*, Vol. 110, 407-442.

[50] Presbitero, A.F. and Zazzaro, A. (2011), "Competition and relationship lending: Friends or foes?", *Journal of Financial Intermediation*, Vol. 20, 387-413.

[51] Rajan, R.G., (1992), "Insiders and outsiders: The choice between informed and arm's length debt", *Journal of Finance*, Vol. 47, 1367-1400.

[52] Sharpe, S., (1990), "Asymmetric information, bank lending, and implicit contracts: A stylized model of customer relationships", *Journal of Finance*, Vol. 45, 1069-1087.

[53] Shavell, S., (1994), "Acquisition and disclosure of information prior to sale", *The RAND Journal of Economics*, Vol. 25 (1), 20-36.

[54] Stein, J.C., (2002), "Information Production and Capital Allocation: Decentralized versus Hierarchical Firms", *Journal of Finance*, Vol. 57, 1891-1921.

[55] Stiglitz, J.E. and Weiss, A., (1981), "Credit rationing in markets with imperfect information", *American Economic Review*, Vol. 71, 393-410.

[56] Stock, J.H. and Yogo, M., (2003), "Testing for weak instruments in linear IV regressions", *Unpublished working paper*, Harvard University.

[57] Uchida, H., Udell, G. F. and Yamori, N., (2006), "SME financing and the choice of lending technology", *RIETI Discussion Paper Series*, 06-E-025, the Research Institute of Economy, Trade, and Industry.

[58] Uchida, H., Udell, G. F. and Yamori, N., (2012), "Loan officer and relationship lending to SMEs", *Journal of Financial Intermediation*, Vol. 21, 97-122.

[59] Weinstein, D.E. and Yafeh, Y., (1998), "On the Cost of a Bank Centered Financial System: Evidence from the Changing Main Bank Relations in Japan", *Journal of Finance*, Vol. 53, 635-672.

Appendix

Table A. Variables definition and source

Three main data sources are used in the empirical analysis: the UniCredit Survey of Italian Manufacturing Firms (SIMF), which cover a three-year period ending in 2006; the province-level database of the Italian National Statistics Office (ISTAT) and the Statistical Bulletin of the Bank of Italy (SBBI). The variables used in the empirical analysis are:

Variable	Definition and source (in parentheses)
Dependent Variables	
Rationed	Dummy taking value one if firm is credit rationed; 0 otherwise. (SIMF)
Strong Rationing	Dummy taking value one if firm is credit strong rationed; 0 otherwise. (SIMF)
Endogenous Variables	
Inconsistency	Dummy taking value one if the firm is in a bank-firm "odd couple". (SIMF)
Rel. Firm/Trans. Bank	Dummy taking value one if the firm is relational and the main bank is transactional. (SIMF)
Trans. Firm/Rel. Bank	Dummy taking value one if the firm is transactional and the main bank is relational. (SIMF)
Control Variables	
Number of banks	Total number of firm's reference banks. (SIMF)
Relationship length	Log of the length of the firm-main bank relationship. (SIMF)
Share on Total loans	Share of the loans the firm receives from its main bank relative to firm's total loans. (SIMF)
Share * Relational length	Interaction term between the share of the loans the firm receives from its main bank relative to firm's total loans and the relationship length. (SIMF)
No Turnover loan officer	Dummy taking value one if the loan officer of the firm's main bank does not change during the 2001-2006 period. (SIMF)
Local	Dummy variable taking value one if the main bank is a smaller-sized cooperative mutual banks, a larger-sized Volksbank type cooperative banks, a saving bank or "other type of bank"; 0 otherwise. (SIMF)
Audit	Dummy taking value one if firm has a its statements externally certified; 0 otherwise. (SIMF)
Size	Log of the firm's number of employees as of the end of December 2006. (SIMF)
Age	Log of the age of firm since foundation, in years. (SIMF)
ROA	Average value of the ratio of firm's EBIT to firm's total assets during 2004-2006 period. (SIMF)
Leverage	Ratio of firm's total loans to the sum of firm's total loans and firm's equity as of end December 2006. (SIMF)
Corporation	Dummy variable taking value one if firm is a join stock company; 0 otherwise. (SIMF)
Center	Dummy variable taking value 1 if the bank branch where the credit relationship with the firm takes place is located in Central Italy; 0 otherwise. (SIMF)
South	Dummy variable taking value 1 if the bank branch where the credit relationship with the firm takes place is located in Southern Italy; 0 otherwise. (SIMF)
HHI	Average value of the Herfindhal Hirschman index of concentration on bank loans in the province during 1991-2004 period. (SBBI)
Value Added Growth	Average growth ratio of the value added in the province during 1991-2004 period. (ISTAT)
Instrumental Variables	
Total branches	Average number of branches per thousands inhabitants in the province during 1991-2004 period. (SBBI)
New branches incumbent	For each province and year we calculated the number of branches created minus those closed by incumbent banks per 1,000 inhabitants; then we compute the average over the years 1991–2004. (SBBI)
New branches entrant	For each province and year we calculate the number of branches created by entrant banks per 1000 inhabitants. Then we computed the average over the years 1991–2004. (SBBI)
Management instability	Average turnover of directors of the branch in the province, measured during 1985-1992 period. (SBBI)

Table 1 . Summary statistics: Full Sample

Variables	Obs.	Mean	Standard Deviation	Min	Max
Dependent Variables					
Rationed*	4,474	0.052	0.221	0	1
Strong Rationing*	223	0.426	0.496	0	1
Control Variables					
Number of banks	4,853	4.973	3.959	1	100
Relationship length (ln)	3,866	2.595	0.782	0	3.912
Share on total loans	3,587	31.806	32.800	0	100
Share_Relational Length	2,826	1.101	1.366	0	4.605
No Turnover Loan Officer*	948	0.259	0.438	0	1
Local*	949	0.503	0.500	0	1
Audit*	1,294	0.376	0.485	0	1
Size	5,067	3.826	1.304	0	9.093
Age	4,779	22.663	14.388	3	72
ROA	4,877	0.056	0.065	-0.100	0.270
Leverage	4,877	0.899	0.113	0.475	0.997
Corporation*	5,137	0.331	0.471	0	1
Center*	5,137	0.162	0.369	0	1
South*	5,137	0.118	0.323	0	1
HHI	5,125	0.111	0.048	0.048	0.369
Value Added Growth	5,125	0.085	0.047	-0.159	0.262
Instrumental Variables					
Total branches	5,125	0.529	0.124	0.210	0.976
New branches incumbent	5,125	0.021	0.008	0.002	0.045
New branches entrant	5,125	0.006	0.004	0.001	0.024
Management instability	5,125	3.566	0.126	3.285	3.922

Note: See Table A for exact definitions. * denotes a dummy variable.

Table 2. Summary statistics: Sub-Sample

Variables	Obs.	Mean	Standard Deviation	Min	Max
Dependent Variables					
Rationed*	1,481	0.153	0.360	0	1
Strong Rationing*	223	0.426	0.496	0	1
Control Variables					
Number of banks	1,510	5.690	4.286	1	50
Relationship length (ln)	1,340	2.623	0.766	0	4.382
Share on total loans	1,231	23.230	25.311	0	100
Share_Relational Length	1,093	0.939	1.318	0	4.248
No Turnover Loan Officer*	944	0.258	0.438	0	1
Local*	944	0.500	0.500	0	1
Audit*	1,002	0.345	0.476	0	1
Size	1,520	3.825	1.303	0	9.093
Age	1,394	24.499	15.634	2	116
ROA	1,446	0.053	0.069	-0.339	0.836
Leverage	1,446	0.890	0.113	0.092	1
Corporation*	1,541	0.409	0.492	0	1
Center*	1,541	0.170	0.376	0	1
South*	1,541	0.097	0.296	0	1
HHI	1,536	0.110	0.048	0.048	0.332
Value Added Growth	1,536	0.085	0.046	-0.159	0.262
Instrumental Variables					
Total branches	1,536	0.536	0.117	0.210	0.976
New branches incumbent	1,536	0.021	0.008	0.002	0.045
New branches entrant	1,536	0.007	0.004	0.001	0.024
Management instability	1,536	3.563	0.124	3.285	3.922

Note: See Table A for exact definitions. * denotes a dummy variable.

Table 3. Indicators of Consistency

Variables	Obs	Mean	Standard Deviation	Min	Max
Relational Firm/Relational Bank	1,541	0.659	0.474	0	1
Relational Firm/Transactional Bank	1,541	0.129	0.335	0	1
Transactional Firm/Relational Bank	1,541	0.124	0.330	0	1
Transactional Firm/Transactional Bank	1,541	0.088	0.283	0	1
INCONSISTENCY	1,541	0.253	0.435	0	1

Table 4. Consistency with bank types

Variables	Obs	Mean	Standard Deviation	Min	Max
Relational Firm/Local Bank	944	0.445	0.497	0	1
Relational Firm/National Bank	944	0.397	0.489	0	1
Transactional Firm/Local Bank	944	0.056	0.230	0	1
Transactional Firm/National Bank	944	0.102	0.302	0	1

Table 5. Indicators of Consistency (bank types split)

Variables	Total		National Bank		Local bank	
	Obs	Mean	Obs	Mean	Obs	Mean
Relational Firm/Relational Bank	944	0.751	471	0.649	473	0.852
Relational Firm/Transactional Bank	944	0.091	471	0.146	473	0.036
Transactional Firm/Relational Bank	944	0.065	471	0.085	473	0.044
Transactional Firm/Transactional Bank	944	0.093	471	0.119	473	0.068

Table 6. Inconsistency and credit rationing. OLS and Probit regressions

Variables	(1) OLS RATIONED	(2) Probit RATIONED
Inconsistency	0.321***	1.023***
	(0.052)	(0.154)
Number of banks	0.013***	0.054***
	(0.005)	(0.016)
Relationship length	-0.048*	-0.210**
	(0.025)	(0.101)
Share on Total loans	0.001	0.006
	(0.001)	(0.004)
Share * Relational length	0.022	0.092
	(0.022)	(0.078)
No Turnover loan officer	-0.093***	-0.402***
	(0.036)	(0.151)
Local	-0.031	-0.196
	(0.032)	(0.126)
Audit	0.044	0.225
	(0.037)	(0.137)
Size	-0.034**	-0.154**
	(0.014)	(0.061)
Age	-0.001	-0.003
	(0.001)	(0.005)
ROA	-0.513**	-2.599***
	(0.204)	(0.901)
Leverage	0.058	0.416
	(0.128)	(0.598)
Corporation	0.060	0.269*
	(0.041)	(0.162)
Center	0.040	0.195
	(0.041)	(0.163)
South	0.020	0.063
	(0.051)	(0.192)
HHI	-0.079	-0.354
	(0.326)	(1.289)
Value Added Growth	0.232	1.162
	(0.288)	(1.214)
Constant	0.223	-0.939
	(0.160)	(0.722)
Observations	697	697
R-squared	0.186	0.189

Note: The table reports regression coefficients and associated robust standard errors (in parentheses). The dependent variables and the estimation method are reported at the top of each column. Rationed is a dummy variable that takes value of one if the firm declare itself as rationed. Inconsistency is a dummy variable that takes the value of one if the firm is in a bank-firm "odd couple". The controls included are: a) firm characteristics, such as size, age of the firm since founding, a dummy variable equal to one if the firm has its financial statement certified, ROA, leverage, legal type, dummies for the sector of activity; b) firm-bank relationship characteristics, such as the number of banking relationships, the duration of the credit relationship with the main bank, the share of loans obtained by the main bank, an interaction term between the last two variables, geographical location; c) main bank characteristics, such as a dummy variable equals to one if the loan officer didn't change in the previous five years, and a dummy variable equals to one if the bank is local; d) variables controlling for the characteristics of the environment where the firms operates, such as the Herfindahl-Hirschman Index on bank loans, in the province, and provincial GDP growth. For more information, exact definitions and details see the Table A. * significant at 10%; ** significant at 5%; *** significant at 1%. The table reports the R^2 (OLS) and Pseudo R^2 (Probit).

Table 7. Inconsistency and credit rationing. First Stage of IV Regressions

Variables	Inconsistency
Total branches	-0.362*
	(0.196)
New branches incumbent	5.279**
	(2.458)
New branches entrant	-9.942**
	(3.914)
Management instability	0.235**
	(0.119)
Number of banks	-0.001
	(0.003)
Relationship length	-0.060***
	(0.021)
Share on Total loans	-0.002*
	(0.001)
Share * Relational length	0.045**
	(0.018)
No Turnover loan officer	0.038
	(0.035)
Local	-0.130***
	(0.029)
Audit	0.029
	(0.034)
Size	-0.000
	(0.014)
Age	0.001
	(0.001)
ROA	-0.536***
	(0.203)
Leverage	0.098
	(0.121)
Corporation	0.015
	(0.033)
Center	0.029
	(0.039)
South	-0.073
	(0.057)
HHI	0.072
	(0.341)
Value Added Growth	-0.255
	(0.249)
Constant	-0.358
	(0.465)
Observations	697
F Statistic (Instruments)	3.05
R-squared	0.125

Note: The table reports regression coefficients and associated standard errors (in parentheses). The dependent variable is Inconsistency. The set of instruments includes: the total number of branches in the province, branches opened by incumbents in the province over the 1991-2004 period (net of closures), branches opened by new entrants in the province over the 1991-2004 period (net of closures) and the average turnover of the management of the branches in the province. Inconsistency is a dummy variable that takes the value of one if the firm is in a bank-firm "odd couple". The control variables of the regressions are the same in Table 6. * significant at 10%; ** significant at 5%; *** significant at 1%. The table reports the value of the *F*-statistics to test the weakness of the instruments.

Table 8. Inconsistency and credit rationing. IV Regressions

Variables	(1) 2SLS RATIONED	(2) 2SCML RATIONED
Inconsistency	1.099***	3.048***
	(0.367)	(0.251)
Audit	0.019	0.059
	(0.048)	(0.129)
Number of banks	0.015***	0.037**
	(0.005)	(0.015)
Relationship length	-0.004	0.006
	(0.039)	(0.107)
Share on Total loans	0.003*	0.008**
	(0.002)	(0.004)
Share * Relational length	-0.017	-0.066
	(0.032)	(0.075)
No Turnover loan officer	-0.123**	-0.331**
	(0.048)	(0.140)
Local	0.075	0.219*
	(0.062)	(0.135)
Size	-0.033*	-0.088
	(0.017)	(0.056)
Age	-0.001	-0.003
	(0.001)	(0.004)
ROA	-0.110	-0.236
	(0.303)	(0.965)
Leverage	-0.019	0.002
	(0.148)	(0.429)
Corporation	0.040	0.093
	(0.048)	(0.136)
Center	0.025	0.071
	(0.046)	(0.125)
South	0.042	0.107
	(0.061)	(0.151)
HHI	0.181	0.595
	(0.437)	(1.092)
Value Added Growth	0.427	1.377
	(0.327)	(0.839)
Constant	-0.057	-1.433***
	(0.239)	(0.531)
Overid. test (p-value)	0.4529	
Wald test (p-value)		0.0045
Observations	697	697

Note: The table reports regression coefficients and associated standard errors (in parentheses). The dependent variable and the estimation method are reported at the top of each column. The set of instruments includes: the total number of branches in the province, branches opened by incumbents in the province over the 1991-2004 period (net of closures), branches opened by new entrants in the province over the 1991-2004 period (net of closures) and the average turnover of the management of the branches in the province. Inconsistency is a dummy variable that takes the value of one if the firm is in a bank-firm "odd couple". The control variables of the regressions are the same in Table 6. * significant at 10%; ** significant at 5%; *** significant at 1%. The table reports the p-values of a Sargan test of overidentifying restrictions and of a Wald test of exogeneity of the variable that has been instrumented.

Table 9. Robustness check: Strong Rationing

Variables	(1) 2SLS STRONGRATIO	(2) 2SCML STRONGRATIO
Inconsistency	0.014	0.028
	(0.350)	(1.039)
Number of banks	0.014	0.038
	(0.013)	(0.037)
Relationship length	-0.127*	-0.370
	(0.072)	(0.234)
Share on Total loans	-0.000	-0.001
	(0.003)	(0.009)
Share * Relational length	0.039	0.095
	(0.057)	(0.175)
No Turnover loan officer	-0.002	-0.011
	(0.102)	(0.298)
Local	0.059	0.192
	(0.088)	(0.262)
Audit	-0.039	-0.151
	(0.097)	(0.298)
Size	-0.010	-0.022
	(0.054)	(0.155)
Age	0.001	0.005
	(0.004)	(0.011)
ROA	-1.103	-3.277
	(0.833)	(2.391)
Leverage	0.382	1.286
	(0.478)	(1.387)
Corporation	0.127	0.338
	(0.118)	(0.329)
Center	0.149	0.458
	(0.149)	(0.447)
South	0.103	0.270
	(0.148)	(0.430)
HHI	-1.342	-4.105
	(1.038)	(2.980)
Value Added Growth	0.123	0.517
	(0.948)	(2.719)
Constant	0.286	-0.717
	(0.554)	(1.618)
Overid. test (p-value)	0.8865	
Wald test (p-value)		0.7852
Observations	145	141

Note: The table reports regression coefficients and associated standard errors (in parentheses). The dependent variable and the estimation method are reported at the top of each column. The set of instruments includes: the total number of branches in the province, branches opened by incumbents in the province over the 1991-2004 period (net of closures), branches opened by new entrants in the province over the 1991-2004 period (net of closures) and the average turnover of the management of the branches in the province. Inconsistency is a dummy variable that takes the value of one if the firm is in a bank-firm "odd couple". The control variables of the regressions are the same in Table 6. * significant at 10%; ** significant at 5%; *** significant at 1%. The table reports the p-values of a Sargan test of overidentifying restrictions and of a Wald test of exogeneity of the variable that has been instrumented.

Table 10. Robustness check: Local and National banks

	2SLS		2SCML	
	(1)	(2)	(3)	(4)
	Local	National	Local	National
Variables	RATIONED	RATIONED	RATIONED	RATIONED
Inconsistency	1.103***	1.679*	4.056***	2.728***
	(0.365)	(0.980)	(0.448)	(0.126)
Number of banks	0.008	0.024**	0.030	0.028*
	(0.005)	(0.010)	(0.021)	(0.016)
Relationship length	-0.083***	0.146	-0.310*	0.255**
	(0.031)	(0.125)	(0.160)	(0.103)
Share on Total loans	0.002	0.006	0.008*	0.010**
	(0.002)	(0.004)	(0.005)	(0.004)
Share * Relational length	0.009	-0.077	-0.007	-0.146*
	(0.029)	(0.086)	(0.099)	(0.082)
No Turnover loan officer	-0.056	-0.176*	-0.223	-0.208
	(0.061)	(0.094)	(0.219)	(0.175)
Audit	0.021	0.020	0.080	0.020
	(0.069)	(0.084)	(0.251)	(0.123)
Size	-0.002	-0.081*	0.008	-0.105
	(0.022)	(0.045)	(0.088)	(0.066)
Age	0.003*	-0.008*	0.011*	-0.011**
	(0.001)	(0.004)	(0.006)	(0.005)
ROA	-0.556*	0.927	-1.873	1.971**
	(0.314)	(0.988)	(1.442)	(0.973)
Leverage	0.182	-0.360	1.108	-0.519
	(0.152)	(0.407)	(0.828)	(0.624)
Corporation	0.027	0.020	0.152	-0.036
	(0.054)	(0.110)	(0.207)	(0.167)
Center	-0.037	0.144	-0.092	0.154
	(0.066)	(0.088)	(0.211)	(0.147)
South	-0.052	0.159	-0.246	0.185
	(0.065)	(0.134)	(0.259)	(0.198)
HHI	0.414	-0.127	2.269	-0.038
	(0.624)	(0.788)	(2.065)	(1.191)
Value Added Growth	0.014	1.161	0.358	1.569
	(0.341)	(0.801)	(1.331)	(1.232)
Constant	-0.069	-0.058	-2.391**	-0.816
	(0.241)	(0.563)	(1.021)	(0.734)
Overid. test (p-value)	0.4690	0.4756		
Wald test (p-value)			0.0037	0.0240
Observations	360	337	344	337

Note: The table reports regression coefficients and associated standard errors (in parentheses). The dependent variable and the estimation method are reported at the top of each column. The set of instruments includes: the total number of branches in the province, branches opened by incumbents in the province over the 1991-2004 period (net of closures), branches opened by new entrants in the province over the 1991-2004 period (net of closures) and the average turnover of the management of the branches in the province. Inconsistency is a dummy variable that takes the value of one if the firm is in a bank-firm "odd couple". The control variables of the regressions are the same in Table 6. * significant at 10%; ** significant at 5%; *** significant at 1%. The table reports the p-values of a Sargan test of overidentifying restrictions and of a Wald test of exogeneity of the variable that has been instrumented.

Table 11. Robustness check: Audited firms

Variables	(1) 2SLS RATIONED	(2) 2SCML RATIONED
Inconsistency	0.892***	2.550***
	(0.291)	(0.331)
Number of banks	0.010	0.030
	(0.008)	(0.020)
Relationship length	-0.098*	-0.245
	(0.060)	(0.174)
Share on Total loans	0.002	0.008
	(0.003)	(0.007)
Share * Relational length	-0.002	-0.013
	(0.049)	(0.131)
No Turnover loan officer	-0.067	-0.176
	(0.065)	(0.207)
Local	0.028	0.078
	(0.070)	(0.185)
Size	-0.026	-0.098
	(0.038)	(0.112)
Age	-0.003	-0.008
	(0.003)	(0.007)
ROA	-0.291	-0.872
	(0.425)	(1.308)
Leverage	-0.053	-0.019
	(0.309)	(0.875)
Corporation	0.059	0.223
	(0.085)	(0.225)
Center	0.093	0.310
	(0.096)	(0.263)
South	0.065	0.235
	(0.102)	(0.255)
HHI	0.379	1.105
	(0.735)	(1.840)
Value Added Growth	0.612	2.287
	(0.752)	(2.405)
Constant	0.328	-0.578
	(0.393)	(1.071)
Overid. test (p-value)	0.6154	
Wald test (p-value)		0.0043
Observations	219	200

Note: The table reports regression coefficients and associated standard errors (in parentheses). The dependent variable and the estimation method are reported at the top of each column. The set of instruments includes: the total number of branches in the province, branches opened by incumbents in the province over the 1991-2004 period (net of closures), branches opened by new entrants in the province over the 1991-2004 period (net of closures) and the average turnover of the management of the branches in the province. Inconsistency is a dummy variable that takes the value of one if the firm is in a bank-firm "odd couple". The control variables of the regressions are the same in Table 6. * significant at 10%; ** significant at 5%; *** significant at 1%. The table reports the p-values of a Sargan test of overidentifying restrictions and of a Wald test of exogeneity of the variable that has been instrumented.

Table 12. Lending relationship length

	2SLS		2SCML	
	(1)	(2)	(3)	(4)
	Length≥15	Length<15	Length≥15	Length<15
Variables	RATIONED	RATIONED	RATIONED	RATIONED
Inconsistency	1.127***	0.062	8.999***	-0.511
	(0.224)	(0.601)	(2.449)	(2.498)
Number of banks	0.009	0.013	0.057	0.041*
	(0.006)	(0.008)	(0.053)	(0.024)
Relationship length	0.186**	-0.080	1.510**	-0.301
	(0.089)	(0.053)	(0.726)	(0.196)
Share on Total loans	0.006**	-0.001	0.048**	-0.003
	(0.002)	(0.002)	(0.019)	(0.006)
Share * Relational length	-0.072*	0.084*	-0.626**	0.298*
	(0.038)	(0.043)	(0.291)	(0.155)
No Turnover loan officer	-0.144**	0.009	-0.842	0.120
	(0.065)	(0.070)	(0.557)	(0.311)
Local	0.015	-0.047	0.249	-0.324
	(0.055)	(0.104)	(0.492)	(0.417)
Audit	-0.058	0.033	-0.568	0.135
	(0.065)	(0.054)	(0.520)	(0.217)
Size	-0.036	-0.032	-0.453*	-0.123
	(0.023)	(0.022)	(0.244)	(0.094)
Age	-0.003	0.000	-0.023	0.002
	(0.002)	(0.002)	(0.016)	(0.008)
ROA	-0.992***	-0.319	-9.825***	-2.190
	(0.362)	(0.713)	(3.692)	(3.231)
Leverage	0.020	0.152	0.629	0.745
	(0.152)	(0.300)	(1.790)	(1.262)
Corporation	0.042	0.060	0.552	0.199
	(0.053)	(0.075)	(0.502)	(0.265)
Center	0.042	0.085	0.397	0.388
	(0.060)	(0.066)	(0.605)	(0.276)
South	-0.014	0.089	-0.124	0.353
	(0.088)	(0.078)	(0.716)	(0.305)
HHI	0.654	-0.643	3.941	-2.975
	(0.635)	(0.574)	(4.121)	(2.626)
Value Added Growth	0.620	0.462	5.362	2.189
	(0.386)	(0.459)	(4.832)	(1.919)
Constant	-0.574*	0.318	-7.489**	-0.425
	(0.342)	(0.526)	(3.214)	(2.105)
Overid. test (p-value)	0.8063	0.6892		
Wald test (p-value)			0.0000	0.5769
Observations	311	332	285	330

Note: The table reports regression coefficients and associated standard errors (in parentheses). The dependent variable and the estimation method are reported at the top of each column. The set of instruments includes: the total number of branches in the province, branches opened by incumbents in the province over the 1991-2004 period (net of closures), branches opened by new entrants in the province over the 1991-2004 period (net of closures) and the average turnover of the management of the branches in the province. Inconsistency is a dummy variable that takes the value of one if the firm is in a bank-firm "odd couple". The control variables of the regressions are the same in Table 6. * significant at 10%; ** significant at 5%; *** significant at 1%. The table reports the p-values of a Sargan test of overidentifying restrictions and of a Wald test of exogeneity of the variable that has been instrumented.

Table 13. Type of mismatch

	2SLS		2SCML	
	(1)	(2)	(3)	(4)
Variables	RATIONED	RATIONED	RATIONED	RATIONED
Relational Firm/Transactional Bank	2.103		3.829***	
	(1.420)		(0.198)	
Transactional Firm/Relational Bank		1.774***		4.246***
		(0.597)		(0.410)
Number of banks	0.021***	0.009*	0.025*	0.021
	(0.008)	(0.005)	(0.013)	(0.013)
Relationship length	0.003	-0.024	0.070	-0.060
	(0.065)	(0.034)	(0.092)	(0.093)
Share on Total loans	0.003	0.002	0.006**	0.005
	(0.003)	(0.002)	(0.003)	(0.003)
Share * Relational length	-0.023	0.000	-0.082	-0.003
	(0.054)	(0.030)	(0.059)	(0.071)
No Turnover loan officer	-0.141*	-0.098**	-0.177	-0.245**
	(0.079)	(0.046)	(0.135)	(0.124)
Local	0.132	-0.007	0.309***	-0.034
	(0.145)	(0.050)	(0.106)	(0.128)
Audit	0.015	0.031	-0.021	0.086
	(0.069)	(0.049)	(0.108)	(0.119)
Size	-0.045*	-0.023	-0.050	-0.057
	(0.027)	(0.019)	(0.050)	(0.052)
Age	-0.001	-0.001	-0.002	-0.002
	(0.002)	(0.001)	(0.003)	(0.004)
ROA	-0.158	-0.201	0.347	-0.584
	(0.474)	(0.324)	(0.808)	(0.923)
Leverage	-0.061	0.041	-0.185	0.167
	(0.234)	(0.158)	(0.357)	(0.418)
Corporation	0.010	0.072	-0.051	0.172
	(0.079)	(0.047)	(0.123)	(0.121)
Center	-0.032	0.077	-0.097	0.211*
	(0.082)	(0.053)	(0.116)	(0.124)
South	0.032	0.044	0.044	0.107
	(0.080)	(0.067)	(0.124)	(0.156)
HHI	0.494	-0.167	1.083	-0.423
	(0.701)	(0.471)	(0.842)	(1.117)
Value Added Growth	0.772	0.072	1.366**	0.387
	(0.607)	(0.358)	(0.544)	(0.930)
Constant	-0.164	0.124	-1.014**	-0.805
	(0.438)	(0.228)	(0.436)	(0.525)
Overid. test (p-value)	0.3718	0.8304		
Wald test (p-value)			0.0224	0.0010
Observations	697	697	697	697

Note: The table reports regression coefficients and associated standard errors (in parentheses). The dependent variable and the estimation method are reported at the top of each column. The set of instruments includes: the total number of branches in the province, branches opened by incumbents in the province over the 1991-2004 period (net of closures), branches opened by new entrants in the province over the 1991-2004 period (net of closures) and the average turnover of the management of the branches in the province. Inconsistency is a dummy variable that takes the value of one if the firm is in a bank-firm "odd couple". The control variables of the regressions are the same in Table 6. * significant at 10%; ** significant at 5%; *** significant at 1%. The table reports the p-values of a Sargan test of overidentifying restrictions and of a Wald test of exogeneity of the variable that has been instrumented.

Survey questions

Which of these characteristics are key in selecting your main bank?

1. The bank knows you and your business.
2. The bank knows a member of your Board of directors or the owners of the firm.
3. The bank knows your sector.
4. The bank knows your local economy.
5. The bank knows your relevant market.
6. Frequent contacts with the credit officer at the bank.
7. The bank takes quick decisions.
8. The bank offers a large variety of services.
9. The bank offers an extensive international network.
10. The bank offers efficient internet-based services.
11. The bank offers stable funding.
12. The bank offers funding and services at low cost.
13. The bank's criteria to grant credit are clear.
14. The bank is conveniently located.

In your view, which criteria does your bank follow in granting loans to you?

1. Ability of the firm to repay its debt (e.g. years needed to repay its debt).
2. Financial solidity of the firm (capital/asset ratio).
3. Firm's profitability (current profits/sales ratio).
4. Firm's growth (growth of sales).
5. Ability of the firm to post (not personal) real estate collateral.
6. Ability of the firm to post tangible non-real estate collateral.
7. Support by a guarantee association (e.g. loan, export, R&D, etc.).
8. Personal guarantees by the firm's manager or owner.
9. Managerial ability on the part of those running the firm's business.
10. Strength of the firm in its market (number of customers, commercial network).
11. Intrinsic strength of the firm (e.g. ability to innovate).
12. Firm's external evaluation or its evaluation by third parties.
13. Length of the lending relationship with the firm.
14. Loans are granted when the bank is the firm's main bank.
15. Fiduciary bond between the firm and the credit officer at your bank.