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A STUDY OF THE EFFECTIVENESS OF CREDIT SUBSIDIES: EVIDENCE FROM A PANEL OF ITALIAN FIRMS

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A Study of the Effectiveness of Credit Subsidies: Evidence from a Panel of Italian Firms

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Abstract

Credit subsidies in targeted industrial sectors or geographical areas are a primary mechanism of industrial and redistributive policy throughout the world. Using a unique panel of bank-firm relationships, we study the impact of interest-rate subsidies on the total amount of borrowing and on the average cost of borrowing for subsidised firms. Even though they seem to promote the rise of new bank-firm relationships, subsidies have a relatively small effect on the total amount of borrowing when granted to existing clients. We also find evidence of a spillover effect of subsidies on non-subsidised interest rates, which is suggestive of possible rent-seeking activities undertaken by banks and their targeted borrowers. The size of the subsidy, the bank's local market power, her informational advantage and the lenght of the bank-client relationship are found to be important determinants of the spillover effect.

Keywords: *Funding gaps, Credit subsidies, Relationship lending, Dynamic panel data models.*
JEL Classification: *H25,G21,D82,C23.*

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1 Introduction

Credit subsidies are widespread worldwide. In the United States the federal government runs over 300 programs meant to provide credit aid to various groups - including households and firms, particularly small businesses - under various forms (provision of loan guarantees, direct lending, and interest rate subsidies). Over the 1980-1987 period federal lending programs extended over $1,200 billion of net subsidised credit, accounting for about a third of total credit market debt (Gale, (1991)). Between 1995 and 1999 the European Community budget for credit programs was as large as 12,7 billion Euros per year and financed as many as 55,000 small businesses[1]. In Italy, subsidies have been the main instrument of industrial policy since the 1950s. A large and increasing proportion of these subsidies (35% in 1996, 41% in 2000[2]) has been used to sustain growth in the most distressed regions of Central and Southern Italy, under a variety of regional and national schemes. This paper provides empirical evidence on the effectiveness of credit subsidies using a panel of firms operating in this geographical area during the period 1995-1998. In this time frame, the percentage of subsidised lending in the specific region that we study amounted to 26.9% of total lending, more than four times the national percentage (6.3%). In Italy, subsidised credit has taken mainly two forms, direct loans and interest subsidies. This paper focuses on the latter form of intervention, which appears to be the most widely used in the area under analysis.

Credit programs are the policy response to the presumed existence of "funding gaps". A "funding gap" is an equilibrium in which the volume of lending (and therefore investment) is below what would emerge in a frictionless market (Cressy (2001), De Meza (2001)). The target of these programs are usually businesses, households or individuals who belong to categories of borrowers (e.g. small businesses, new ventures, high-tech manufacturing firms) which are believed to be more likely to face difficulties in obtaining bank credit because of frictions of informational nature. The objective of this form of intervention is to raise the volume of lending up to the efficient (full information) level. The main theoretical line of argument that justifies the use of credit subsidies to achieve this goal refers to the seminal work by Stiglitz and Weiss (1995). If quality is defined as the intrinsic riskiness of a project on which borrowers have private information, interest rates work as a screening device. Higher interest rates may discourage less risky borrowers and worsen the average quality of the pool of applicants. In equilibrium, interest rates may be such that safe and viable projects go unfunded[3]. Subsidised credit is generally provided under easier

[1] Source: European Commission Bulletin 18-10-2000 Com (2000) 653.

[2] De Bonis, Piazza and Tedeschi (2001).

[3] During the period 1994-1998, the European Investment Bank (EIB) - under its temporary lending facility (SME Facility) - extended about 92.3 million ECU to small and medium-sized enterprises in the form of interest subsidies on loans. The general feeling of uncertainty of the time obliged credit institutions to be more selective in the granting of loans and to provide themselves with high interest spreads. The measure was motivated by the fear that firms could be "forced to give up a

terms, such as reduced interest, reduced collateral or longer maturity compared to non-subsidised credit. Interest subsidies, in particular, are designed to create a wedge between the interest rate paid by the borrower and the one pocketed by the bank. By generating interest savings for target borrowers, subsidised finance should therefore attract those borrowers that would otherwise be discouraged to demand loans by high interest rates and make lending to target groups profitable for the bank too.

In spite of the importance assigned to credit programs by policy makers, as revealed by the documented significant amount of resources that they absorb, credit subsidies have received little attention among applied economists. Concerns have been raised about the role played by credit subsidies in promoting investment and growth (De Meza and Webb (1987), Gale (1989), Gale (1990), Hoff and Stiglitz (1997), De Meza (2001))[4], but few empirical tests of their effectiveness have been conducted (Gale (1991), De Bonis, Piazza and Tedeschi (2001), Battistin, Gavosto and Rettore (2001), Del Monte and Scalera (2001)). Gale (1991) studies the economic and welfare effects of the US federal government credit programs by carrying out a numerical simulation of the effects of various credit policies on a model based on Gale (1990). He concludes that "most direct welfare gains appear to accrue to borrowers who would have received credit without subsidies. These subsidies represent pure windfall gains for the recipients, with no obvious social benefit" (p.135). While interesting, these simulations can only be suggestive and cannot be taken as evidence. De Bonis, Piazza and Tedeschi (2001) consider instead a panel of Italian banks and find the existence of a positive correlation between the amount of subsidies granted by banks and a worsening of the quality (default rate) of their assets (loans), which they attribute to the fact that subsidies reduce the banks' incentives to monitor their clients. Remaining studies (see Battistin, Gavosto and Rettore (2001), Del Monte and Scalera (2001) for instance) base the evaluation of the support programmes on the study of the determinants of the survival probability of subsidised firms and conclude that subsidies are ineffective because they reach firms whose chance of survival is highly dependent on the size of the subsidy they receive.

With the recent work on survival analysis we share the idea that a proper evaluation of the effectiveness of credit programs should investigate whether they reach the intended beneficiaries. We nevertheless follow a different empirical strategy. We study the impact on subsidies by observing the effect they exert on subsidised firms' total bank indebtedness and average cost of loans. Our analysis is made possible by

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number of investment projects which would offer insufficient returns in view of the [high] interest rate" (Commission of the European Community, Brussels 22/06/2000).

[4]Gale (1990) sustains that in a market-clearing equilibrium, the main effect of interest subsidies is to increase the targeted group demand for loans (and investment), thereby inducing an overall increase of interest rates which crowds out general borrowers' demand for loans. If the target group is credit-rationed or red-lined, subsidies fail to increase the bank's return to lending, and no increase in the bank's effective demand for loans to the targeted group occurs. De Meza (2001) argues that, if funding gaps exist at all, it is always borrowers with negative net present value projects that are attracted by credit subsidies.

a unique dataset containing detailed information on all loans extended by a bank to its customers. The dataset provides details of the terms of the loan contracts - interest rates, size of loans, contractual forms - and allows us to distinguish between subsidised and non-subsidised loans[5]. Our first goal is to assess whether subsidies stimulate investment, as, from a policy perspective, this should be the ultimate goal of these programs. We first investigate how subsidies are allocated among different categories of borrowers. In particular, we assess whether subsidies promote the initiation of new credit relationships as one of their potential benefits should be to make access to credit easier for those firms that would be unable to borrow otherwise. We find that, although 40% of new relationships are born with a subsidy, 86% of total subsidies are granted to the existing clients of the bank. For the latter category of borrowers, we then study how the total volume of lending changes as a result of a subsidy. Credit subsidies foster corporate investments if an overall increase in the amount of loans can be observed. Contrarily, we find evidence that subsidised loans tend to replace almost one-to-one pre-existing loans, with presumed very limited effect on investment. In particular, the substitution effect is particularly important for those borrowers who seems to be subject to less stringent financial constraints, which reinforces our conjecture that subsidies are ineffective because they tend to reach firms that would have received finance even without subsidies. Under this circumstance, the effect of a subsidy is to generate a pure windfall or *rent* for the coalition formed by the bank and the recipient firm, which the parties can share according to their relative bargaining position[6]. Interest rates actually paid by borrowers on subsidised loans are generally fixed by the programs. Nevertheless, subsidies can only be extended on loans of a limited size, and borrowers usually resort to additional non-subsidised finance to cover their financial needs. The observed interest rates on these loans may therefore reflect the bargaining process over the surplus generated by the subsidy. Interestingly, we find empirical evidence in support of this conjecture. An increment in the size of the subsidy granted to a firm generates a positive spillover on the price of non-subsidised loans. We take the existence of this spillover as evidence that the bank may be appropriating of at least part of the surplus generated by the subsidy. Consistently, we find that the bank's monopoly power is an important determinant of the size of the spillover and that the pattern of surplus appropriation by the bank obeys the principles of inter-temporal surplus sharing which is typical of relationship lending.

The paper is organized as follows. In section 2 we describe the allocation mechanism and the main features of interest subsidies. In section 3 we describe the dataset used. In section 4 we present our empirical results on the impact of subsidies on total quantities loaned and on the rise of new relationships. In section 5 we provide

[5] Needless to say, the data we have access to do not enable identification of the borrowers, who remain anonymous.

[6] Also Scalera and Zazzaro (2000) point out that subsidies may be socially costly because they promote rent-seeking activities by the beneficiaries of the programmes.

evidence which suggests that appropriation of surplus by the bank managing the subsidy might be taking place. Section 6 concludes the paper and discusses the policy implications of our results.

2 The allocation mechanism of credit subsidies

In Italy, credit programmes provide financial support under mainly the following forms (or a combination of them): direct loans by public agencies, interest rate subsidies, and capital subsidies. In case of direct loans banks just receive an intermediation fee, and funds are provided by public bodies which can offer loans at tax-exempt interest rates. Capital subsidies are often intermediated by banks, and they are non-refundable transfers of public money usually granted in one or more installments over the time span covered by the project being financed. The beneficiaries of interest subsidies, instead, receive loans by banks (private funds) at basic interest rates which are essentially the banks' cost of funds plus an intermediation fee which represents the profit for the bank managing the subsidy. According to the maturity of the loan, the cost of fund is determined by the short-term or long-term yield of sovereign bonds; the intermediation fee is instead determined by the Ministry of Finance every year, it varies between 1 and 2 base points and usually varies across sectors. The contractual interest rate is paid partly by the subsidised borrower and partly by the subsidising agency according to split ratios which are fixed by the programs. The actual subsidy is the fraction of interest paid by the subsidising government agency, and this may change across programs. Under the terms specified by "Legge Sabatini" (L. n.1329, 28/11/65), for instance, the share of the conventional rate paid by the government agency is usually higher for recipients located in more distressed geographical areas. The way these credit programs are designed is not typically Italian. The interest subsidy on loans extended by the European Investment Bank (EIB) under its temporary lending facility in the 1990s took the form of an interest rebate fixed at 2 base points, and which was paid to firms which were already borrowers of EIB loans under easier terms that would otherwise be obtained in credit markets.

In order to address specific target groups, the law regulating the program defines eligibility requirements in terms of objective and verifiable characteristics of the beneficiary, like belonging to certain categories (small young businesses, households, students) or industries (agriculture, mining...). The government body that sponsors the program relies on banks as intermediaries in the allocation of subsidised funds. Banks are endowed with screening technologies that may sort out borrowers who are most in need of financial support among all those belonging to a certain targeted group. So as to obtain a given form of subsidy the applicant firm needs to provide the subsidising government agency with evidence that they have successfully passed the screening process of a bank authorised to provide that form of subsidy.

Authorisation to supply subsidised funds is granted through different mechanisms according to whether the subsidising body is the central national government or local government authorities. All banks are automatically entitled to provide subsidised finance under national schemes. Nevertheless, banks need to apply to local authorities to obtain an official authorisation to intermediate in the allocation subsidies regulated by these authorities. The public body that provides the majority of subsidies extended to the clients of the bank that we analyse in this work is the Regional Authority. Great part of the funds is provided by the European Community, and what the Regional Authority does is to decide which categories of individuals or firms to target and to which banks to grant the licences. The criterion generally adopted is market share. The rationale behind this criterion might be that banks with a larger market share can reach a larger fraction of targeted firms and, presumably, allocate funds more efficiently. It is clear that the mechanism used to allocate authorisations to supply subsidies can give certain banks market power in the provision of certain forms of subsidised finance. In equilibrium, banks may even find it profitable to specialise in certain forms of services and products by applying for certain licences and not for others. This means that subsidies provided by competing banks may not be perfect substitutes for borrowers. These may face switching costs when moving away from their preferred bank and banks may turn this into their advantage.

3 The data

We base our analysis on an extremely rich and, in several respects, unique database obtained from a medium sized bank operating in Italy with a strong geographical concentration. For obvious confidentiality reasons we do not report its name; for brevity, we will refer to it as “the Bank”. The Bank has over 2,000 employees and operates mainly in local markets (approximately 300 municipalities) where - at least over the span of time under analysis - she enjoys considerable market power. Indeed, she is the only operating bank in 70% of these municipalities, and she also has considerable market power in the provision of subsidised finance, too. Between 1994 and 1998, the Bank extended more than 47% of loans subsidised by local authorities against 50% and 1.5% extended by its two main competitors, respectively. The share of total interest subsidies distributed by the Bank on those loans was just over 40% against 57% and 1% by the main competitors. By looking at the range of subsidised forms of finance the Bank and her largest competitor provide, we can say that the former is basically monopolist in the provision of subsidised finance to agricultural firms while the latter specialises in the provision of subsidised finance to manufacturing firms. There seems to be a certain competition on commercial firms and artisans, but the Bank provides a much wider range of products to these categories of firms.

Data are quarterly snapshots of the population of the Bank’s clients and cover the period 1995, third quarter, 1999, second quarter. For each client we know a set of demographic characteristics (legal form, location, location of the loan etc.), and for the subset of incorporated or sufficiently large firms we also have information on various items in their balance sheet. For each loan the firm obtains from the Bank, the information includes the amount granted and actually used (for credit lines), the type of the loan (whether it is a mortgage, a credit line, a discount window etc.), the interest rate charged and the interest rate actually paid. We also know whether collateral has been pledged and the type of the collateral, the date the loan was first issued, when it was revised and, who, within the Bank approved the loan and who is currently in charge of it. Finally, and most importantly for the purpose of this paper, for each loan, we know whether it is a subsidised loan and the extent of the subsidy, measured by the share of interest rate paid by the subsidising body. Furthermore, for each customer the Bank computes a score obtained weighting various pieces of information relating to the firm performance as a client of the Bank. The score - which we term "internal score" - provides a useful control for firm's quality as perceived by the Bank at each point in time. It weights several indicators of borrower's behavior such as regularity in repayments, and the frequency or persistence of overdrafts on loans over the preceding quarter. The score varies between 0 and 8, with values of the score closer to 8 (bankruptcy status) signalling firms in situation of dramatic distress and values closer to 0 identifying essentially healthy firms.

As all other banks, the Bank reports information to, and receives some, from the Credit Register (CR form now on), which is a device administered by the Bank of Italy whose purpose is to allow information sharing among lenders on clients who borrow more than 75,000 Euros ($ 75,000). Regardless of the amount borrowed, all debtors in default are reported to the CR[7]. Each bank obtains from the CR information on the overall financial exposure of its clients with the banking system, the number of their lending institutions and indicators of distressed borrowers. We supplement these data with information on the market share of the Bank in its local markets, identified with the individual municipalities in which the Bank operates.

Since one of our objectives is to investigate the impact of subsidies on investment, we restrict attention to productive firms. We therefore exclude households which are mere consumers, but also financial institutions and public bodies as we cannot separate those that borrow from the Bank to finance investments from those that may have a pure settlement of debit/credit positions with the Bank. We also exclude borrowers that have entered a bankruptcy procedure. This leaves us with a total of roughly 60,000 clients whose characteristics are summarised in Table 1, in Appendix 4. They are mainly represented by individual firms and partnerships (89.7%), in great part family managed. The Bank seems to engage in financing operations of very modest scale (average client indebtedness of 92.23 million Liras, average number of contracts per client 2.21), which reflects the characteristics of the industry of the geographical area in which she operates. Firms are very small in size, as revealed by the fact that only 23% of them are reported to the CR and these have a modest average

[7]Some clients may have a CR report even though their total indebtedness is below the critical threshold just because the Bank may have requested a "first information" on the firm, and it turned out that the firm was not reported by any bank. The total indebtedness towards the bank is therefore taken to be the total indebtedness towards the banking system.

indebtedness towards the banking system (1,976.94 million Liras). More than 50% of the bank's clients are subsidised borrowers. This partly reflects the geographical location of the Bank, which operates in what the European Commission classes as "Target Area Number 1", a region where subsidies are particularly widespread. It is also the result of the Bank enjoying monopoly power in the provision of subsidised finance.

Subsidised borrowers do not seem to differ significantly from non-subsidised ones. If anything, they seem to represent "better quality" firms. They are slightly smaller is size, as they receive total loans of 68.00 million Liras by the Bank and 1,440.86 by the banking system, of which the amount of subsidised loans granted or administered by the Bank represents on average 70% and 3.5% respectively. The fraction of interest rate paid by the subsidising agency is on average 65% of contractual rates. Small size could signal that subsidies do reach firms that are likely to be more affected by informational problems in the market for loans. Nevertheless, they seem to be older, and a smaller percentage of them is represented by limited liability companies. Since only sufficiently large firms and limited liability companies are bound to publish their balance sheet, this information is available only for a very small sub-sample of firms (approximately 4,200 individuals). Figures on average sales confirm that subsidised firms tend to be smaller than non-subsidised ones. Moreover, although all firms seem to be rather "illiquid" (the ratio between operational costs and sales, which we take as a measure of cash flow, is close to 1), subsidised firms seem to be doing less extensive use of commercial debt, which could mean that they might be less subject to financial constraints. This is corroborated by the fact that they also appear to have a better "internal score" than non subsidised borrowers, meaning that they are more likely to behave correctly with the Bank and pay back their loans in time. If we look at the contractual terms of the loans, we notice that there is no significant difference in the *average* contractual interest rates charged on subsidised borrowers compared to the entire population of borrowers, even though the former tend to be charged lower nominal rates; similarly, interest rates on the *non-subsidised* loans of subsidised borrowers are lower than the average. At the same time, there seems to be no difference in the amount of collateral requested by the bank for the two categories of borrowers. To the extent that non-subsidised interest rates can be taken as a proxy of "quality", also this fact could signal that subsidised borrowers are better types. For the minority of clients reported to the CR, also we know that they are more likely to establish a one-to-one credit relationship pattern, as opposed to the non-subsidised clients reported to the CR.

4 The effect of subsidies on quantities

4.1 New credit relationships

In order to evaluate the effectiveness of credit subsidies we need to verify whether they reach the intended beneficiaries of the programs. The information elaborated insofar seem to suggest that, *on average*, subsidised borrowers tend to be better quality clients than non-subsidised ones, or at least not worse types. At this stage it is not possible to assess whether this is because better quality clients receive subsidies in the first place, or because the beneficiaries of credit programs perform better as a result of a subsidy. In this section we therefore study how subsidies are allocated to the various categories of borrowers. In particular, we want to investigate what fraction of total subsidised lending is used to foster the initiation of new credit relationships. Indeed, one of the potential benefits of credit subsidies could be to make access to credit easier for firms that would be either not willing or unable to borrow otherwise. If subsidies reach disadvantaged groups, we should find that, compared to firms that start a credit relationship without a subsidy, the recipients of the programs are firms which are younger, smaller, minority-owned or organised in the form of limited liability companies.

In Table 2 in Appendix 4, we report the number of new bank-firm relationships born quarter by quarter from 1994/III to 1998/III (first column), and the number of those which started with at least a subsidised loan (second column, percentages in column 3). We define a client as "new" if it has been a client of the Bank for less than a year[8]. Figures show that, on average, 40% of the new relationships started each quarter by the Bank are born with a subsidy. If we compare the characteristics of the clients born with a subsidy and those born without (Table 3, Appendix 4), we notice that the former tend to be on average younger (8.66 years old versus 11.67). They also tend to be smaller, and they have a more modest initial indebtedness[9] towards the Bank (average initial exposure of 36.44 million Liras versus 89.76) and only 5% of them is reported to the CR compared to 25% for those born without a subsidy. Among the clients reported to the CR, subsidised ones have a smaller total indebtedness to the banking system (average total exposure of 876.29 million Liras versus 3,208.28) and tend to have the Bank as a main creditor (including the Bank, on average 1.12 banks report these clients to the CR compared to 3.62 for the control group). In addition, the percentage of new credit relationships started with female owned (or managed) firms, generally considered a disadvantaged group, is slightly - even though not significantly - higher among clients born with a subsidy.

In so far, the information revealed by the data may suggest that subsidies do

[8] We omit the last 3 quarters of the sample because we do not count borrowers that drop out of the sample within a year. These are usually firms on which the bank gathered preliminary information but which did not ultimately receive finance from the Bank.

[9] Figures represent the amount of the loans actually *used* by the borrowers at the time their credit relationship with the bank starts.

reach more disadvantaged firms. To check whether these firms are also more financially constrained we would need balance sheet information. This is unfortunately available only for few individuals, not only because these firms are very small, but also because they are in large part individual firms and partnerships, and as such not bound to make their balance sheet information public. The fact that only 2% of subsidised borrowers report balance sheet data compared to 20% of non-subsidised ones is therefore in line with the fact that subsidised borrowers are indeed smaller (average total sales are indeed 2.510.2 million Liras and 8,795 million Liras respectively) and a significantly smaller percentage of them is organised in the form of limited liability company (2.80% compared to 20.97%).

Table 3 also contains interesting information about the contractual characteristics of the loans. Both categories of borrowers start a credit relationship with the Bank with only one contract. For the category of subsidised borrowers, this has the interesting implication that the bank and the borrower do not contract upon the interest rate charged on the loan as this is fixed by the credit program. The data shows that, at the time they start a credit relationship with the Bank, the average total interest rate paid by subsidised clients on their loans is 4.22 points lower than the interest rate paid by non-subsidised ones. Subsidies allow these borrowers to save in interest rates payments. This idea is also corroborated by the evidence that the Bank does not impose higher collateral requirement on subsidised new clients, as revealed by the absence of any significant difference in the average percentage of guaranteed loans between the two groups. Nevertheless, this should be weighted against the fact that a larger part of subsidised borrowers are unlimited liability firms, with associated higher guarantee of loan recovery in case of bankruptcy.

We also look at the way the Bank allocates subsidies between new and old clients, as this is going to be relevant for the analysis on quantities and prices that follows. Table 2 reports the total amount of *new* subsidised loan contracts signed each quarter (column 4) and the fraction granted to new clients of the Bank (column 5 and 6). Figures show that, on average, new subsidies granted to new clients represent only 14% of total subsidies granted by the Bank, implying that 86% of the subsidies go to her old clients. Interesting insights can be obtained from the comparison between new and old subsidised firms. The former are younger and they are represented by a higher percentage of female owned firms, even though a smaller percentage of them is organised in the form of limited liability company. Even though they do not differ in size, as measured by sales, new subsidised clients have a more modest indebtedness but, on average, they maintain a one-to-one credit relationship with the Bank. Interestingly, the number of loans from the Bank increases when they get older and so does their average interest rate.

In summary, the above analysis shows that subsidies may indeed foster the initiation of new credit relationships and reach firms that are more likely to face difficulties in raising finance for their projects. However, the proportion of subsidies granted to finance new relationships in each quarter is modest compared to the amount of subsidies granted to the existing clients of the Bank. New clients seem likely to benefit from the savings in interest rates that subsidies can generate, while old clients pay only slightly lower interest rates compared to the average computed on the entire population of borrowers. In what follows we provide a possible explanation for this evidence by analysing the impact of subsidies on the existing clients of the Bank.

4.2 Existing credit relationships

We take variations in the total indebtedness of a firm as a proxy for investment, and we evaluate the impact of subsidies on total quantities loaned by the clients of the Bank from the banking system. If subsidies relieve credit constraints, we should observe that the total quantities loaned to a firm by the banking system increases as a result of a subsidy. If instead subsidies hardly affect total quantities loaned, we take this as evidence of a substitution effect between subsidised and non-subsidised quantities. From a welfaristic point of view, subsidies would be ineffective, as they would tend to finance existing investment projects rather than new ones.

We believe that a proper investigation of the impact of subsidies on the decisions taken by the Bank and the beneficiaries of the programs requires a dynamic perspective for essentially two reasons. The first one is that, if an existing client is granted a subsidy at time t, the whole set of his old contracts may be subject to renegotiations which may take place over time rather than at time t. In addition, some of the explanatory variables included in our model (see Appendix 2) show endogeneity features, and a dynamic specification would allow us to correctly estimate their impact on the dependent variable.

We estimate the autoregressive distributed lag panel data model specified and discussed in Appendix 2 using quarterly data over the period 1995/III-1999/II on the whole sample of firms (subsidised and non subsidised) which are observable for more than a year. Our explanatory variable is the total amount of outstanding loans (net of any temporary cash credit) extended by the banking system to each firm. This implies that we can only concentrate on clients which are reported to the CR, as only for these firms we have information on their total bank debt exposure. We normalise total loans for each firm by total sales. The null hypothesis of "no effect on quantities" is that scaled total quantities remain unaffected by variations in the amount of subsidies received by a firm. The normalisation has an important methodological advantage since it is robust to the criticism of reverse causality, which applies to the tests based on the correlation between the (existence and size of the) subsidy and the subsequent performance of the firm. Nevertheless, it implies a further restriction of the sample, so that we end up conducting a proper econometric test on a small fraction of the population of "old" clients of the Bank (see Table 1).

Table A.1 in Appendix 2 reports the estimation results on the entire sample. Among the control variables, the history of the firm's internal score, the collateralised value of assets, and the firm's cash flow are found to have a positive and highly

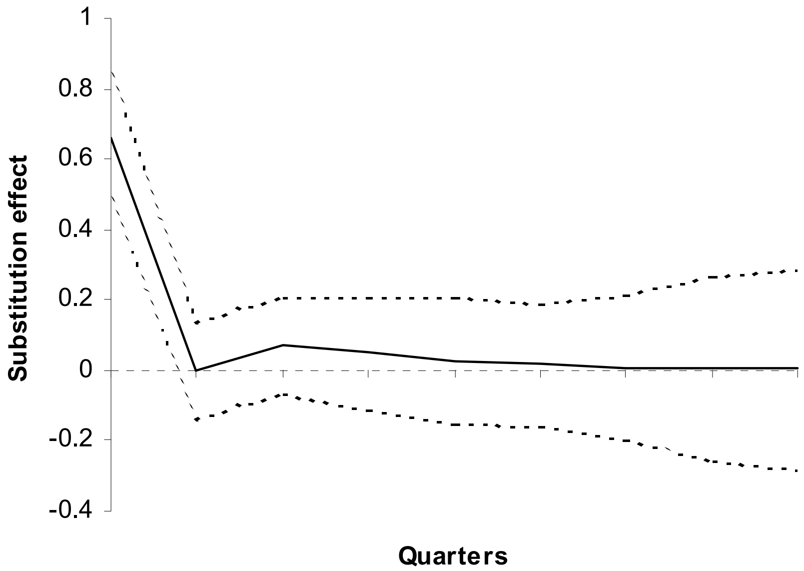

Figure 1: Effect of subsidies on total loans over time

significant effect on the total bank indebtedness of a firm. Let us focus our attention on the effects of subsidised loans on total loans over time. Table A.2 in Appendix 2 reports the estimated contemporaneous and lag coefficients up to $(t+8)$ of subsidised loans on total loans (column 2) with associated standard errors (column 3). They are calculated to assess a possible lagged response of total loans to subsidised loans at time t. The last row contains the long-run coefficient that summarizes the effects of subsidised loans on total loans beyond this timeframe. The lag coefficients are also plotted in Figure 1 with confidence bands.

An analysis of the estimation results reveals a contemporaneous positive and significant effect (66%) that decreases sharply in the next quarter and the absence of any important significant effect of subsidised loans on total loans lagged in time. Looking at Figure 1, the zero-line falls always between the confidence band from the second quarter onward. The long-run effect is also insignificant, too. Therefore, these results may be interpreted as evidence of a possible substitution effect between subsidised and non subsidised loans persistent over time.

The fact that subsidies appear to substitute existing loans may be seen as evidence that they end up financing existing projects rather than new ones or, alternatively, that subsidies reach borrowers that could have received finance even without subsidies. In order to shed some light on the determinants of this substitution effect, we test whether it is more or less sensitive to borrowers being subject to more or less stringent financial constraints. If our conjecture is correct, we should observe that for more financially constrained firms the substitution effect is less important. We therefore split the individuals into two sub-samples: those having a ratio of trade debt on total debt below the median (0.39), and those with the same ratio above the median. Firms bearing lower trade debt are taken as those with less stringent financial constraints[10]. The estimation results are contained in Table A.3 in Appendix 2 and the response of quantity to subsidies over time is summarized in Table A.4. This dynamic path is also plotted in Figure A.1 for illustrative purposes. For firms belonging to the first sub-sample, a unit increment in normalized subsidies determines a significant contemporaneous increment in total normalized loans of 0.60 compared to 0.80 for firms belonging to the second group. Moreover, in the long-run the impact of subsidies on quantities reduces to a mere 0.26 and non significant effect for sub-sample 1, so that we cannot exclude the possibility of a total substitution effect between subsidised and non-subsidised loans. Contrarily, for sub-sample 2, the long-run effect remains significantly above zero, even though the substitution effect is still non-negligible (around 0.58).

5 The effect of subsidies on prices

In the previous sections we have shown that subsidies may be used to start new credit relationships or to sustain borrowers facing financial tensions, but, on average, they seem more likely to be granted to borrowers that are in good health and that would have received finance even without a subsidy. In this section we provide more evidence on this claim by showing that subsidies do interact with the intertemporal surplus sharing between borrowers and lenders which is typical of relationship lending.

When subsidies do not cover the entire financial needs of a firm, the bank and the recipient may have to negotiate over the terms and conditions of non-subsidised loans. If subsidies reach firms that would have received finance even without a subsidy, they end up generating a pure windfall for the bank-firm coalition which the contracting parties may share according to their relative bargaining position. In order to test for this conjecture, we look at the determinants of the average interest rate subsidised firms pay on non-subsidised loans. If surplus sharing occurs, then we should find that the cost of private funds changes with the size of the subsidy granted to a firm. In particular, the entity of these changes should respond to variations in the Bank's monopoly power and in her informational advantage over competitors (temporary monopoly power).

This part of the analysis is conducted on the sample of all firms (subsidised and non-subsidised) excluding those that receive only subsidised loans. The variable to be explained is the average interest rate charged on the non-subsidised loans of a borrower, and the explanatory variables of our model are described in Appendix 3. We want to assess the impact on the dependent variable of a unit change in

[10] See Petersen and Rajan [1995].

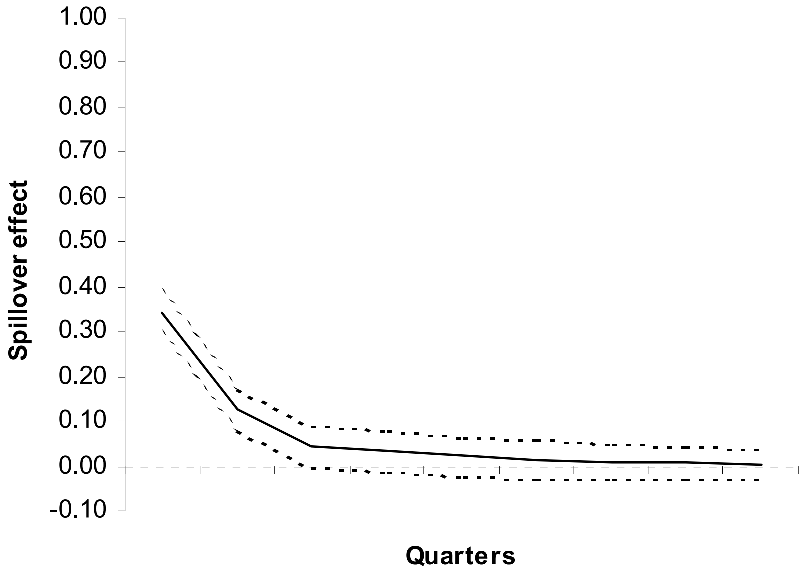

Figure 2: Effect of subsidies on non-subsidised interest rates over time

the entity of the subsidy granted to a firm. As a proxy for the size of the subsidy we use total payments in interest rates paid by the subsidising body normalised by total non-subsidised loans. Estimation results are reported in Table B.1 in Appendix 4. Among the variables that significantly affect the level of non-subsidised interest rates we have the credit rating of the borrower, the percentage of collateralised non-subsidised loans, the market interest rate, the average maturity of non-subsidised loans. Table B.2 in Appendix 4 has the same structure of Table A.2. It reports the estimated contemporaneous, lag and long-run coefficients of the size of the subsidy on the average interest rate of non-subsidised loans with associated standard errors. Figure 2 plots the lag coefficients with confidence bands. These empirical results show that a unit change in the size of the subsidy exerts a significant positive effect on the average interest rate on non-subsidised loans at the time the subsidy is granted that does not vanish in a year time frame.

The estimated adjustment process over time is such that, on average, a unit increment in the size of the subsidy granted to a firm at time t determines a contemporary significant increment of 0.34 base points of the average interest rate of non-subsidised loans. The impact monotonically decreases over time, becoming insignificant after the third quarter. In the long run, we estimate an average significant impact of subsidies on prices of 0.85 base points.

This result suggests that subsidised borrowers pay, on average, higher interest rates on non-subsidised loans compared to non-subsidised borrowers of similar characteristics. Moreover, the extent of this spillover increases with the size of the subsidy. This might indeed be evidence that, on average, the bank managing the subsidy may be appropriating at least part of the surplus generated by the subsidy via higher interest on non-subsidised loans. To be able to sustain this claim, we need to investigate what factors may be important in determining the extent of this "spillover effect". In the following section we split the sample distinguishing between clients that are likely to have weaker/stronger bargaining power in contracting with the Bank and examine the resulting effects on the entity of the spillover.

5.1 Sample splits by a traditional measure of market power: local market share

A possible source of market power of the bank is the geographical distribution of competing banks in the local markets where she operates. The closer a bank is to her client, the less costly it is for her to monitor or transact with her client (Petersen and Rajan (1995)). This is particularly true in our sample where, not only because the Bank's clients are particularly small in size; but also because they are very often located in geographically isolated local markets. We therefore test the sensitivity of the spillover on interest rates to market power by splitting our sample into clients who have most of their banking relations with the Bank in municipalities where the Bank is the only operating credit institution (the share of the Bank liabilities over total bank liabilities equals one) and clients based in more competitive markets. Table B.3 in Appendix 4 contains the entire set of estimation results, the estimated contemporaneous, lag and long-run coefficients with associated standard errors for the two sub-samples are reported in Table B.4 in Appendix 4. They are also plotted in Figure B.4. They show a similar decreasing pattern.

The estimation results show that the estimated impact of credit subsidies on the average interest rates on non-subsidised loans is almost double if the bank is monopolistic than if the bank is not, not only at time t when the subsidy is granted (0.45 versus 0.24), but also in the long run (1.32 versus 0.61).

In summary, the extent of the spillover on prices increases with the Bank's local market power, which, in the case under study, is an important component of her relative bargaining position. Since the spillover effect is positive, we can claim that subsidised borrowers end up paying higher interest rates on non subsidised loans than non-subsidised firms with similar characteristics. In turn, the fact that this spillover is a function of the Bank's market power suggests that she may be appropriating of at least part of the surplus generated by the subsidies she administrates.

5.2 Sample splits by information-based measures of market power

5.2.1 Multiple banking relationship

A lender's bargaining position can be reinforced by her being the main financier of the firm. Banks acquire private information over their exclusive lending relationship with a firm and this may translate into a competitive advantage on competitors. The spillover on interest rates generated by a subsidy could therefore depend on whether a client is more or less informationally captured by the Bank. We therefore split the sample into borrowers for whom the bank is the main (unique) creditor and those who instead borrow from more than one bank and we estimate the same model specification detailed in Appendix 3 for each group separately (estimation results in Table B.5). The number of observations shrinks as information on the number of creditors of a firm is available only for those clients reported to the CR.

Table B.6 shows that for borrowers for whom the Bank is the main (only) bank, a unit increase in the subsidy generates a contemporary increment of non-subsidised average rates of 0.42 base points higher than for those that have multiple banking relations. As it is also illustrated in Figure B.6, the effect decreases over time and, in the long run, it turns out to be 1.01 base points higher for the firms which have a main-bank relationship and which may be more informationally captured.

5.2.2 Information sharing

An alternative way to test whether informational capture is indeed a determinant of the spillover on prices we found, we split our sample into clients that are reported to the CR and those who are not. In fact we know that banks share some information on their clients when these are reported to the public Credit Register, and this might increase the degree of competition between banks. Results are shown in Table B.7 and B.8 and illustrated in Figure B.8, Appendix 4.

Again we find evidence in support of the fact that the Bank and her subsidised clients may be sharing the surplus generated by the subsidy. The data reveal that firms that are not reported experience a higher spillover effect of subsidies on prices both in the short run (contemporaneous effect of 0.38 versus 0.20) and in the long run (0.99 versus 0.41).

5.2.3 Length of the lending relationship

The results obtained insofar show that the extent of surplus appropriation by the bank managing the subsidy is significantly affected by the private information that she acquires during the lending relationship with her clients. Nevertheless, private information generates a *temporary* monopoly power as information leaks to competitors as the client gets older. A long (and therefore successful) credit relationship with a bank is indeed a good signal for the market. We should therefore expect that the spillover of subsidies on the price of non-subsidised loans changes during a borrower credit relationship with the Bank. Indeed, our empirical results suggest that, on average, there is a non linear relationship between relationship length and non-subsidised loans' interest rates: the Bank tends to extract more surplus from clients with a medium-length lending relationship rather than from new or old clients.

Using the empirical distribution of the length of relationship l_i over our sample, we define as new clients the ones whose l_i falls within the third quantile ($l_i \leq 2.5$ years), as medium-length relationship clients the ones whose l_i falls between the third and the seventh quantile (2.5 years$< l_i <$ 12 years) and as old clients the ones whose l_i falls in the last three quantiles ($l_i \geq$ 12 years). We run the same model specification detailed in Appendix 3 separately for the three groups of borrowers (estimation results in Table B.9). The estimated contemporaneous, lag and long-run coefficients of subsidised loans on the average interest rate on non-subsidised loans (with associated standard errors) for the three sub-samples are reported in Table B.10 and plotted in Figure B.10, Appendix 4.

We find that the contemporaneous estimated impact of credit subsidies on the average interest rates on non-subsidised loans is higher for medium-length clients (0.29) than for new (0.13) or old clients (0.12). The dynamic response is similar for the three different categories. The "spillover effect" is also more relevant for medium-length clients rather than new or old ones in the long-run (0.72 versus 0.45 and 0.29 respectively).

The reason why surplus extraction may be lower on new clients could be explained using, again, a *relationship lending* type of argument. New clients as well as young firms face uncertainty about the prospects of their projects, and they need incentives (lower interest rates) to choose safer projects. If the bank anticipates that she can extract surplus in the future, she will be willing to give up surplus extraction early on in the relationship (Petersen and Rajan [1995]).

5.2.4 Borrowers subject to financial constraints

The analysis conducted on the sensitivity of the spillover to the length of a borrower's credit relationship has shown that surplus appropriation by the bank managing the subsidy may reflect the intertemporal surplus sharing pattern which is typical of relationship lending. The Bank makes concessions in times when the firm needs incentives because she can count on higher future surplus extraction once the firm is well established. This can also be seen by comparing the entity of the spillover on prices for firms that are subject to more or less severe financial constraints. We split the sample between firms with a percentage of trade debt on total debt below the median of the distribution (0.39) - sub-sample 1- and those with a percentage above the median - sub-sample 2. Results are reported in Appendix 4, Tables B.11 and B.12. Figure B.12 plots the lag coefficients with confidence bands.

We find that one unit increment in the size of the subsidy generates a significant spillover of 0.33 base points on the average interest rate of non-subsidised loans for firms in sub-sample 1, which is 0.14 base points higher than for firms in sub-sample 2. When looking at the long-term effect, we find confirmation that the entity of the spillover is higher for firms facing less severe financial constraints (0.78) than for firms facing more severe financial constraints (0.31).

5.2.5 Borrowers in financial distress

Subsidies are implicitly contingent on a firm surviving. Thus, the introduction of subsidies should increase the incentive of a bank to keep a firm alive, especially if the Bank enjoys monopoly power over the borrower. The more important the monopoly power, the more the Bank internalises the benefit of the subsidy and thus the more willing it is to give up a bigger share of the subsidy today to increase the probability that the firm survives. If this is true we should observe that the Bank captures less of the subsidy when the borrowing firm is in financial distress and more so the more monopoly they enjoy.

We divide the clients between those based in local markets where the Bank is the only operating bank and those operating in markets with more competition. We further split each subsample into borrowers with a very good internal score (firm's internal score equal to 0 at time t) and clients that are facing liquidity problems (firm's internal score greater than 0 at time t). Figure B.14 shows the contemporaneous and lagged impact of subsidies loans on non subsidised loans' interest rate obtained by estimating our base model for each of the four sub-samples (estimation results contained in Tables B.13 and B.14 in Appendix 4).

Looking at the results, one can note that the estimated contemporaneous impact of subsidised loans on the average interest rate on non-subsidised loans is higher for clients with internal score equal to 0 than for clients that are facing liquidity problems (0.44 versus 0.15). And this pattern is preserved when we look at the long-run effects (0.31 versus 0.24). The Bank is therefore willing to give up surplus extraction in difficult times to give her the chance to overcome temporary difficulties. When we compare the spillover effect of subsidies across markets where the Bank has different monopoly power we notice that she tends to make more concessions to distressed borrowers when she is a monopolist than when she is not (contemporary effect 0.44 versus 0.31 and in the long run 0.87 versus 0.78); consistently, she extracts more surplus on good borrowers when she has more market power (contemporary effect 0.15 versus 0.24 and in the long run 0.41 versus 0.55).

6 Conclusions

By using an exclusive dataset of bank-firm relationships, we were able to provide some empirical evidence on the effectiveness of credit subsidy programs. We have shown that they can promote the rise of new credit relationships with small, young firms, which are usually thought to suffer from financial constraints. Nevertheless, subsidies end up being granted in great part to existing clients. For these borrowers, subsidised loans replace almost one-to-one pre-existing loans, suggesting very limited effect on total quantities loaned and, presumably, on new investment. We conclude that subsidies, on average, reach firms that could have received finance even without credit assistance. Under this circumstance, they tend to generate a pure windfall for the bank and the recipient firm, and which the parties will share according to their relative bargaining position. This conjecture is corroborated by the evidence found on the impact that subsidies exert on interest rates charged on non-subsidised loans, on which banks and subsidised firms are free to negotiate. We find that an increment in the size of the subsidy granted to a firm generates a positive spillover effect on these prices. Interestingly, the entity of the spillover changes according to a pattern which reflects the intertemporal surplus sharing between banks and their clients typical of relationship lending. The spillover is larger the larger is the bank's local market power and the larger her informational advantage to competitors. Nevertheless, it tends to be lower in case the recipient is a relatively new client, if it is more likely to be financially constrained or if it is facing temporary financial distress. In other words, since the profit a bank and a recipient firm make on a subsidy is contingent on the firm being a client of the bank and on the firm surviving, subsidies increase the bank's incentive to start new relationships and to keep the firm alive. A higher expected profit made on a subsidy when the firm is known to be good gives the bank a higher incentive to make concessions to the firms in times in which either she faces temporary liquidity crises or it is difficult for her to raise finance because of uncertainty about its future prospects, and this incentive is higher the higher is the bank's monopoly power.

The main implication of the analysis conducted in this paper is that issues of relationship lending and competition in the local credit markets where subsidies are distributed should not be neglected when assessing the desirability and the effectiveness of support programmes. Indeed, if banks tend to deny credit to potentially new clients or to firms facing temporary difficulties more than it would be socially optimal, subsidies would alleviate this problem and more credit market concentration could reinforce their effectiveness; as a result, even the actual cost of rent-seeking activities by the beneficiaries of the programs should be evaluated within a dynamic framework of intertemporal surplus sharing between banks and their clients. Contrarily, subsidies would promote the rise of new bank-firm relationships which may in turn be kept alive longer than the social optimal would demand. For this reason, a survival analysis used to assess the effectiveness of credit subsidies - i.e. how well selected the beneficiaries are - should take relationship lending and market structure issues into account.

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7 Appendix 1. The Econometric Methodology

The empirical evidence presented in Section 4 and 5 is based on the estimation of different autoregressive distributed lag panel data models:

$$c(L)y_{it} = \mu + \sum_{k=1}^{K} B_k(L)x_{it}^k + \eta_i + v_{it}, \qquad i = 1, ..., N;\ t = 1, ..., T, \tag{1}$$

where y_{it} is a dependent variable, x_{it}^k (for $k = 1, ..., K$) is a set of K explanatory variables, $c(L) = 1 - \gamma_1 L - \gamma_1 L^2 - ... - \gamma_p L^p$ and $B_k(L) = b_{k0} + b_{k1}L + b_{k2}L^2 + ... + b_{Kq}L^q$ are associated polynomials in the lag operator with p and q as the maximum lag, where q need not be the same for all explanatory variables. We exploit the longitudinal characteristic of our data to control for firm-specific unobservable factors that, if neglected, may bias the estimation results. The disturbance term follows conventional assumptions: η_i is a firm-specific effect with mean 0, v_{it} is a white noise component with mean 0 and uncorrelated with η_i. Our aim is to assess the impact of subsidised loans, say x_{it}^1, on the dependent variable. The dynamic specification (1) not only allows us to control for the persistence in the process of the dependent variable data but also to investigate the possible existence of a time lag between the allocation of the subsidy and its associated impact on the dependent variable An empirical study on the effectiveness of credit subsidies lacking to take this latter possibility into account may be misleading. In fact, it is reasonable to think that if an existing client is granted a subsidy at time t, the whole set of his old contracts may be subject to renegotiations which may take place over time rather than at time t. A contemporary effect of subsidised loans on the dependent variable has an additional impact on the future values of the dependent variable due to the autoregressive specification.

In order to observe the impulse response characteristic of the model and to get a straightforward interpretation of the parameters, we calculate the distributed lag coefficients. These direct effects can be obtained by rewriting equation (1) as:

$$y_{it} = \mu + \frac{D(L)}{C(L)}x_{it}^1 + \sum_{k=2}^{K} \frac{B_k(L)}{C(L)}x_{it}^k + \eta_i + v_{it}, \qquad i = 1, ..., N;\ t = 1, ..., T,$$

where the notation is as in equation (1) and subsidised loans, x_{it}^1, has been separated from the other explanatory variables for ease of clarity. $D(L) = d_0 + d_1L + d_2L^2 + ... + d_4L^4$ is its associated polynomial in the lag operator.

The lag coefficients on the dependent variable are the coefficients of the individual terms in the ratio of the polinomials $D(L)$ and $C(L)$:

$$A(L) = \frac{D(L)}{C(L)} = a_0 + a_1L + a_2L^2 + ... + a_4L^4, \qquad i = 1, ..., N;\ t = 2, ..., T.$$

Therefore, the lag coefficients can be computed simply by equating the coefficients in

$$A(L)C(L) = D(L).$$

The long-run effect is then simply given by the sum of the lag coefficients,

$$\sum_{i=0}^{\infty} a_i = \frac{D(1)}{C(1)}.$$

Since the lag coefficients $A(L)$ are a nonlinear function of the terms in the polynomials $D(L)$ and $C(L)$, their standard errors are calculated using the *delta method*. The variance covariance matrix for the coefficients in $A(L)$, Ω, is obtained from

$$\Omega = \Psi \Sigma \Psi'$$

where Ψ is the matrix of partial derivatives of the lag coefficients with respect to the estimated coefficients (the ones in $D(L)$ and $C(L)$) and Σ is the covariance matrix for the estimated coefficients. The lag coefficients describe the impact on the change of the dependent variable at time $t+g$ originated from the allocation of a subsidy at time t.

Our empirical investigation focuses on the effects of credit subsidies on different dependent variables using different samples. We concentrate our attention on the analysis of the contemporaneous and lag coefficients of subsidised loans. We choose to calculate the lag coefficients up to $(t+8)$ quarters (two years) and to summarize the effects beyond this timeframe with the long-run coefficient. [11]

Appendix 2 and Appendix 3 describe the specification of model (1) and the related estimation strategy used to analyse the effects of credit subsidies on quantities (Section 4) and the effects of credit subsidies on the interest rate of non-subsidised loans (Section 5), respectively. Appendix 4 reports the estimation results.

8 Appendix 2. Effects of subsidies on quantities

8.1 Specification and estimation strategy

We consider equation (1) as a reduced form relationship that explains the total quantity loaned (normalised by sales) to a target firm i at time t, y_{it}, denoted as q_tot as a function of the subsidised loans (normalised by sales), x^1_{it}, denoted as q_sub, and other variables. Theoretical considerations suggest that other variables that could be relevant in the determination of total quantities borrowed are: collateralised value of assets (fixed assets plus stock over total assets) denoted by *coll*, which is a measure of the value creditors can satisfy their claims upon in case of default and which affects the banks' willingness to lend; operational costs over total sales, denoted by *gest*, which is a measure of the liquidity needs of the firm and that should influence

[11] Given the exploratory purpose of our study, we do not report here the cumulated lag coefficients. They can simply be calculated by the sum of the lag coefficients, $a_0 + a_1 + a_2 + ... + a_g$ and represent the whole effect resulting from the allocation of a subsidy, i.e. the total change of the dependent variable after g quarters. They are available upon request.

the amount of loans firm i demands; the number of bank creditors over sales, denoted by *ban*, which is a measure of the strength of the firm credit relationships and which affects banks' willingness to lend; the firm's internal score, denoted by *srv*, as a measure of the quality of the firms as a client of the Bank. If the borrower is using loans within limits and paying back overdrafts without delays, then the borrower is classified as a good one (*srv=0*). If the borrower persistently overuses his loans or fails to pay back his loans the Bank puts him under a surveillance status (*srv>0*), under which is closely monitored and put under pressure for loan repayments. Eventually, either the firm normalizes its position or enters bankruptcy. What determines a bank's willingness to grant a loan depends on the *history* of its internal score: a firm who has always behaved well before time t and behaves well at time t, is more likely to receive loans at time t, ceteris paribus. We therefore consider the average firm's internal score over the periods before time t, denoted by *srv_h*. We also include the banks' cost of funds, denoted by *t_rif*, to take into account of short-term variations in the market conditions.

Standard specification tests on the model (1) suggest that a lag of three quarters for *q_tot* and *q_sub* is advisable and that only contemporaneous values for the other conditioning variables are relevant.

We estimate this dynamic panel data model using the first-differenced GMM estimator (GMM-diff) suggested by Arellano and Bond (1991). This methodology consists in taking first differences over time to purge the model from firm specific unobservable factors and in using appropriate instruments for the lagged dependent variable and for the other endogenous variables. Besides *q_sub*, that is a portion of *q_tot* and it is treated symmetrically with the dependent variable, all the explanatory variables, with the exception of *t_rif,* are also treated as potentially endogenous variables. Indeed, the stock value of investment today (*coll*) depends on how much bank money firm i receives and has received from its bank lenders, the cash flow the business produces (*gest*) depends on the investments made by firm i, which in turns depends on how much money firm i receives and has received from banks, the number of a firm's lenders (*ban*) may also be a function of how dependent it is on institutional credit and, finally, the higher the firms' total indebtedness towards the banking system the more likely it is to be put under pressure of loan repayment and to enter a surveillance status (*srv>0*). However, the level values of these variables at time t are not supposed to be correlated with future shocks. Under the specified assumptions for the composed error structure, valid instruments are obtained by using values of these endogenous variables that are at least two-times lagged. Regarding the choice of the instruments for *q_tot* and *q_sub* , the autoregressive specification up to three lags requires at least a five-time period lag in order to get valid instruments. Therefore, the instrumental set for each cross-sectional unit i contains observations on *coll*, *gest*, *ban*, *srv* dated $(t-2)$ and earlier, the contemporaneous value of *t_rif* and observations on *q_tot* and *q_sub* dated $(t-5)$ and earlier. Tables A.1 and A.3, Appendix 4 report the estimation results on different subsamples. No evidence of misspecification is revealed in any table. The Sargan test of overidentifying restrictions (Sargan, 1958) does not reject the null of instrument validity; tests for first-order, m_1, and second-order serial correlation, m_2, in the first-differenced residuals give no signal of serial correlation in the original error term (*p-value* reported in squared brackets)[12]. Tables A.2 and A.4, Appendix 4 contain the lag coefficients with associated standard errors for the different samples analysed. The relevant empirical evidence is discussed in Section 4.2.

9 Appendix 3. Effects of subsidies on prices

9.1 Specification and estimation strategy

We specify model (1) considering as dependent variable, y_{it}, the average interest rate charged on the non-subsidised loans of a target firm i at time t, denoted as *tme_nc.* We include as explanatory variables the size of the subsidy (total interest payments paid by the subsidising agency, normalised by total non-subsidised loans), denoted as *sub*; the market interest rate, denoted by *t_rif,* the percentage of non-subsidised contracts with a floating interest rate, denoted by *perflo;* the average maturity of non-subsidised contracts, denoted by *mat_ns*; the percentage of collateralised non-subsidised contracts, *pgar*; and *srv_h* (already defined in the previous section).

Also in this case, standard specification tests on the model (1) suggest that a lag of three quarters (a year) for *tme_nc* and *sub* is appropriate and that only contemporaneous values for the other conditioning variables are relevant.

Also in this case, we estimate this dynamic panel data model using the first-differenced GMM estimator (GMM-diff) suggested by Arellano and Bond (1991). We assume that all the explanatory variables are strictly exogenous with the exception of *pgar* and *srv_h.* Indeed, decisions related to the amount of collateral pledged to a loan (*pgar*) and the interest rate charged on that loan are made simultaneously and the interest rate charged to a borrower can be regarded as a proxy for the quality of the borrower. Also, the probability the firm pays back overdrafts without delays (which affects *srv_h*) is influenced by the contracted interest rate on non-subsidied loans. Although all contemporary and lagged values of the strictly exogenous variables can be used as instruments for each cross section equation in first differences, these variables are used only to instrument themselves to avoid a possible overfitting bias. Therefore, the instrumental set for each cross-sectional unit i contains contem-

[12] The Sargan test is asymptotically distributed as χ^2 under the null of instrument validity, with degrees of freedom (reported in parentheses) given by the difference between the number of overidentifying restrictions and number of parameters. m_1 and m_2 are tests for first-order and second-order serial correlation in the first-differenced residuals asymptotically distributed as $N(0,1)$ under the null of no serial correlation (Arellano and Bond, 1991). The consistency of the GMM estimators requires the absence of serial correlation in the original error term. In turn, this requires negative first-order, but no second-order correlation in the differenced error term.

porary observations on *t_rif*, *perflo*, *mat_n*s, observations on *pgar* and *srv_h* dated $(t-2)$ and earlier and observations on *tme_n* and *sub* dated $(t-5)$ and earlier. The estimation results are reported in Tables B.1 to B.12, Appendix 4 for different subsamples and discussed in Section 5. No evidence of misspecification is revealed.

10 Appendix 4. Estimation results

The estimation results reported in this section and discussed in Sections 4 and 5 are two steps GMM estimates using the first-differenced GMM estimator suggested by Arellano and Bond (1991).[13]

The precision of the GMM-diff estimators may be improved if an additional set of moment conditions relating to the model in levels can be used. This strategy results in the so-called system GMM estimator (GMM-sys) suggested by Arellano and Bover (1995), that combines the set of basic moment conditions relating to the equations in first differences with a set of moment conditions relating to the equations in levels. A GMM-sys estimator has also been used in our empirical analysis. However, the estimates of the parameters remain almost unchanged and the gain in precision appears also to be marginal in all the specification adopted. This is probably due to the fact that the process of the dependent variable is not very persistent and that the variance of the firm-specific effects, η_i, does not exceed the variance of the random disturbances, v_{it}.[14] Therefore, these estimation results are not reported here.[15]

[13] The estimation results are obtained using Ox version 3.0 (Doornik, 2001).
[14] See Blundell and Bond (1998) for theoretical details.
[15] They are available upon request.

Table A.1: Effect of subsidies on quantities
Dep. var: total loans

	Entire sample	
	Coeff.	*St. err.*
q_tot (-1)	0.6976***	0.0426
q_tot (-2)	-0.0822***	0.0210
q_tot (-3)	-0.03406**	0.0146
q_sub	0.6596**	0.0878
q_sub (-1)	-0.4587***	0.1253
q_sub (-2)	0.1254	0.0664
q_sub (-3)	-0.202**	0.0999
gest	0.0769***	0.0125
coll	0.0462**	0.0205
t_rif	-0.0038	0.0105
ban	0.0938	0.0660
srv_h	-0.0089**	0.0030
	Sargan test	510.8
	(529)	[0.707]
	m_1	-3.691*** [0.000]
	m_2	-1.021 [0.307]

Notes to all Tables:
Time dummies included
***: signifcant at 1% probability level
**: signifcant at 5% probability level
*:signifcant at 10% probability level

Table A.2: Dynamic response of quantities to subsidies

	Entire sample	
time	*Lag coeff.*	*St. err.*
t	0.6596	0.0878
t+1	0.0015	0.0683
t+2	0.0705	0.0690
t+3	0.0491	0.0796
t+4	0.0284	0.0900
t+5	0.0158	0.0879
t+6	0.0087	0.1024
t+7	0.0048	0.1301
t+8	0.0026	0.1427
Long run	0.2967	0.3200

Table A.3: Effect of subsidies on quantities Dep. var: total loans				
	Sub-sample 1		*Sub-sample 2*	
	Coeff.	*St. err.*	*Coeff.*	*St. err.*
q_tot (-1)	0.7323***	0.0422	0.6607***	0.0552
q_tot (-2)	-0.0923***	0.0241	-0.0603**	0.0305
q_tot (-3)	-0.0375*	0.0201	-0.0382*	0.0209
q_sub	0.6075***	0.1041	0.8071***	0.0880
q_sub (-1)	-0.4204**	0.1574	-0.4586***	0.1042
q_sub (-2)	-0.0891**	0.0452	0.2316**	0.1044
q_sub (-3)	0.1716**	0.0773	-0.2507**	0.1260
gest	0.0719***	0.0150	0.1323***	0.0335
coll	0.0239	0.0273	0.0416	0.0328
t_rif	-0.0052	0.0185	-0.0019	0.0133
ban	0.0633	0.0685	0.9420**	0.4008
srv_h	-0.0115**	0.0044	-0.0091**	0.0039
	Sargan test (529)	560.6 [0.165]	*Sargan test* (529)	520.04 [0.6012]
	m_1	-3.217** [0.001]	m_1	-14.73*** [0.000]
	m_2	-1.064 [0.288]	m_2	1.671 [0.095]

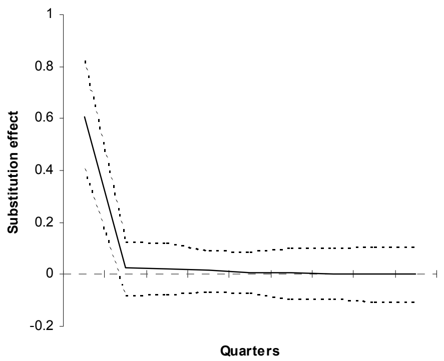
Sub-sample 1: Less financially constrained firms
Sub-sample 7: More financially constrained firms

Table A.4: Dynamic response of quantities to subsidies

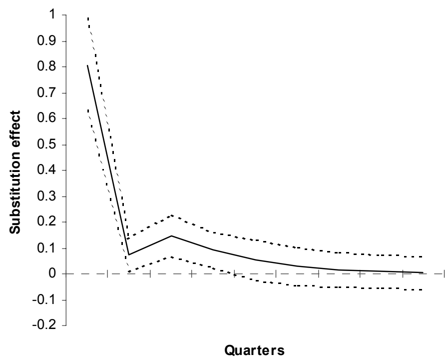
	Sub-sample 1		*Sub-sample 2*	
time	*Lag coeff.*	*st. err.*	*Lag coeff.*	*st. err.*
t	0.6075	0.1041	0.8071	0.0881
t+1	0.0245	0.0521	0.0747	0.0315
t+2	0.0227	0.0499	0.1486	0.0396
t+3	0.0144	0.0401	0.0937	0.034
t+4	0.0084	0.0399	0.0529	0.0389
t+5	0.0048	0.0488	0.0293	0.0373
t+6	0.0028	0.0495	0.0162	0.0332
t+7	0.0016	0.0521	0.0089	0.0323
t+8	0.0009	0.0529	0.0049	0.0313
Long run	0.2633	0.3201	0.4216	0.2012

Sub-sample 1: Less financially constrained firms
Sub-sample 7: More financially constrained firms

Figure A.4: Dynamic path



Sub-sample 1: Lag Coefficients



Sub-sample 2: Lag Coefficients

Table B.1: Effect of subsidies on prices
Dep. var: Average interest rate on non-subsidised loans

Entire sample		
	Coeff.	*St. err.*
tme_nc(-1)	0.5599***	0.0143
tme_nc(-2)	0.0711***	0.0104
tme_nc(-3)	0.0117	0.0086
sub	0.3434***	0.0235
sub (-1)	-0.0653***	0.0085
sub (-2)	0.0263***	0.0070
sub (-3)	-0.0012	0.0045
pgar	-0.1918***	0.0417
mat_ns	0.0004***	3.49e-06
t_rif	0.6251***	0.0275
perflo	0.0938	0.0660
srv_h	0.0372***	0.0046
	Sargan test	294.8
	(355)	[0.991
	m_1	-12.57*** [0.000]
	m_2	1.101 [0.271]

Table B.2: Dynamic response of prices to subsidies

Entire sample		
time	*Lag coeff.*	*st. err.*
t	0.3434	0.0235
t+1	0.1269	0.0235
t+2	0.0424	0.0210
t+3	0.0328	0.0159
t+4	0.0214	0.0188
t+5	0.0143	0.0213
t+6	0.0095	0.0192
t+7	0.0063	0.0182
t+8	0.0042	0.0172
Long run	0.8481	0.0410

Table B.3: Effect of subsidies on prices
Dep. var: Average interest rate on non-subsidised loans

	Sub-sample 1		*Sub-sample 2*	
	Coeff.	*St. err.*	*Coeff.*	*St. err.*
tme_nc(-1)	0.5940***	0.0234	0.5407***	0.0176
tme_nc(-2)	0.0414**	0.0178	0.0823***	0.0126
tme_nc(-3)	0.0305**	0.0139	-0.0014	0.0107
sub	0.4555***	0.0233	0.2445***	0.0242
sub (-1)	-0.0114**	0.0054	-0.0673***	0.0103
sub (-2)	-0.0130**	0.0051	0.0368***	0.0081
sub (-3)	0.0101**	0.0036	-0.0083	0.0054
pgar	-0.3149***	0.0673	-0.1293**	0.0528
mat_ns	0.0037***	5.76e-06	0.0004***	4.41e-06
t_rif	0.5862***	0.0436	0.6458***	0.0340
perflo	1.2058***	0.2319	0.3255***	0.1019
srv_h	0.0436***	0.0079	0.0357***	0.0057
	Sargan test (355)	369.06 [0.293]	*Sargan test* (355)	388.6 [0.106]
	m_1	-10.66*** [0.000]	m_1	-10.45** [0.002]
	m_2	0.950 [0.342]	m_2	-1.095 [0.273]

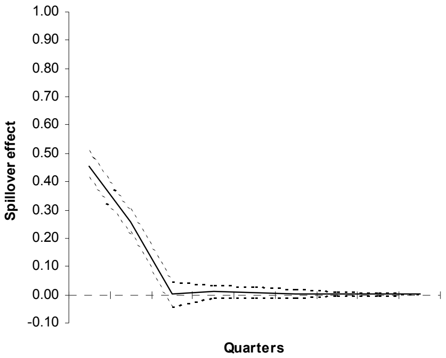
Sub-sample 1: Monopolistic markets
Sub-sample 2: Non monopolistic markets

Table B.4.: Dynamic response of prices to subsidies

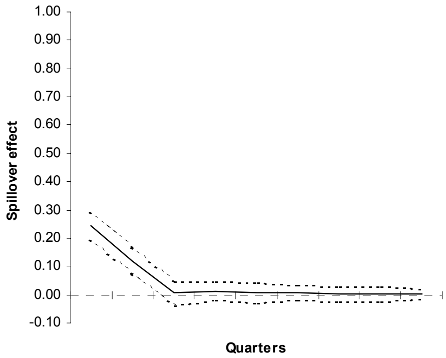
	Sub-sample 1		*Sub-sample 2*	
time	*Lag coeff.*	*st. err.*	*Lag coeff.*	*st. err.*
t	0.4555	0.0233	0.2445	0.0242
t+1	0.2591	0.0203	0.1208	0.0236
t+2	0.0028	0.0214	0.0057	0.0206
t+3	0.0124	0.0111	0.0130	0.0170
t+4	0.0075	0.0101	0.0075	0.0180
t+5	0.0050	0.0088	0.0051	0.0134
t+6	0.0033	0.0032	0.0034	0.0132
t+7	0.0021	0.0027	0.0023	0.0127
t+8	0.0014	0.0001	0.0015	0.0090
Long run	1.3199	0.0989	0.6082	0.0412

Sub-sample 1: Monopolistic markets
Sub-sample 2: Non Monopolistic markets

Figure B.4: Dynamic path



Sub-sample 1: Lag coefficients



Sub-sample 2: Lag coefficients

Table B.5: Effect of subsidies on prices
Dep. var: Average interest rate on non-subsidised loans

	Sub-sample 1		*Sub-sample 2*	
	Coeff.	*St. err.*	*Coeff.*	*St. err.*
tme_nc(-1)	0.3592***	0.0275	0.2786***	0.0404
tme_nc(-2)	0.1282***	0.0199	0.1534***	0.0323
tme_nc(-3)	0.0666**	0.0206	-0.0191	0.0279
sub	0.5632***	0.0288	0.1396***	0.0298
sub (-1)	-0.0121**	0.0048	0.0189	0.0167
sub (-2)	0.0102**	0.0048	0.0002	0.0042
sub (-3)	0.0023	0.0038	-0.0091*	0.0054
pgar	-0.1522	0.1211	-0.3552	0.2427
mat_ns	0.0004***	7.45e-06	0.0004***	0.000012
t_rif	0.6996***	0.0866	0.8955***	0.1354
perflo	1.0124***	0.2344	0.4539	0.3769
srv_h	0.0116	0.0125	0.0411	0.0271
	Sargan test (355)	340 [0.707]	*Sargan test* (355)	379.6 [0.178]
	m_1	-4.220*** [0.000]	m_1	2.402** [0.016]
	m_2	-1.643 [0.100]	m_2	0.4272 [0.669]

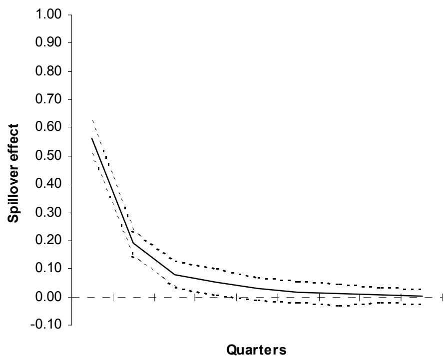
Sub-sample 1: Main bank relationships
Sub-sample 2: Multiple banking relationships

Table B.6: Dynamic response of prices to subsidies

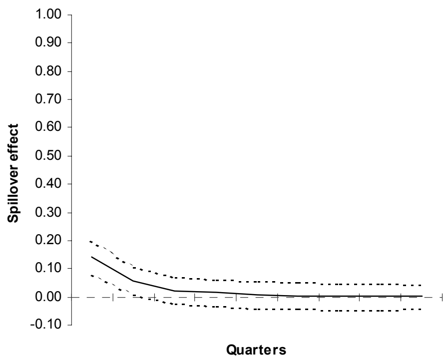
	Sub-sample 1		*Sub-sample 2*	
time	*Lag coeff.*	*st. err.*	*Lag coeff.*	*st. err.*
t	0.5632	0.0288	0.1396	0.0298
t+1	0.1902	0.0231	0.0578	0.0243
t+2	0.0802	0.0240	0.0227	0.0240
t+3	0.0532	0.0234	0.0152	0.0234
t+4	0.0294	0.0194	0.0077	0.0239
t+5	0.0174	0.0194	0.0045	0.0237
t+6	0.0100	0.0183	0.0024	0.0233
t+7	0.0058	0.0133	0.0014	0.0232
t+8	0.0034	0.0133	0.0008	0.0203
Long run	1.2643	0.0291	0.2548	0.0289

Sub-sample 1: Main bank relationships
Sub-sample 2: Multiple banking relationships

Figure B.6: Dynamic path



Sub-sample 1: Lag coefficients



Sub-sample 2: Lag coefficients

Table B.7: Effect of subsidies on prices
Dep. var: Average interest rate on non-subsidised loans

	Sub-sample 1		*Sub-sample 2*	
	Coeff.	*St. err.*	*Coeff.*	*St. err.*
tme_nc(-1)	0.6696***	0.0182	0.3186***	0.0233
tme_nc(-2)	-0.0117	0.0154	0.1209***	0.0163
tme_nc(-3)	0.0039	0.0113	0.0639***	0.0169
sub	0.3800***	0.0346	0.1992***	0.0447
sub (-1)	-0.0650***	0.0096	-0.0075	0.0052
sub (-2)	0.0296***	0.0077	0.0050	0.0047
sub (-3)	-0.0092**	0.0047	0.0053**	0.0021
pgar	-0.3339***	0.0590	-0.1829*	0.1035
mat_ns	0.0004***	4.38e-06	0.0004***	6.25e-06
t_rif	0.6218***	0.0319	0.8271***	0.0758
perflo	0.1029	0.1320	0.6977***	0.1893
srv_h	0.0458***	0.0061	0.0200*	0.0110
	Sargan test	305.5	*Sargan test*	342.01
	(355)	[0.973]	(355)	[0.6803]
	m_1	-14.78*** [0.000]	m_1	-3.171** [0.002]
	m_2	-0.7429 [0.458]	m_2	0.5065 [0.612]

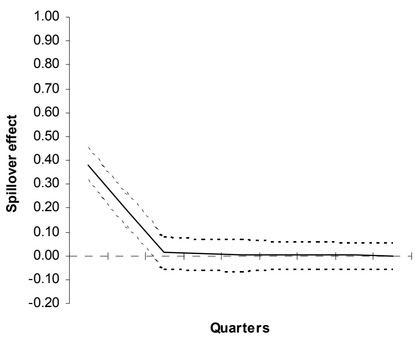
Sub-sample 1: Firms not reported to CR
Sub-sample 2: Firms reported to CR

Table B.8: Dynamic response of prices to subsidies

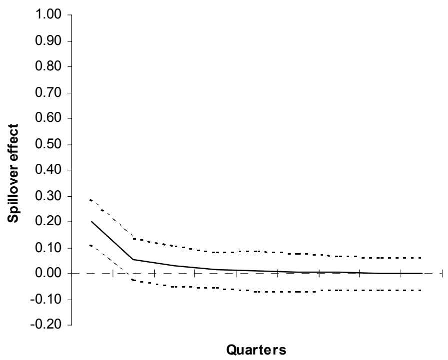
	Sub-sample 1		*Sub-sample 2*	
time	Lag coeff.	st. err.	Lag coeff.	st. err.
t	0.3800	0.0346	0.1992	0.0447
t+1	0.1894	0.0345	0.0559	0.0391
t+2	0.0129	0.0340	0.0287	0.0396
t+3	0.0064	0.0334	0.0159	0.0340
t+4	0.0042	0.0330	0.0085	0.0389
t+5	0.0027	0.0293	0.0046	0.0373
t+6	0.0018	0.0283	0.0025	0.0332
t+7	0.0011	0.0273	0.0014	0.0321
t+8	0.0007	0.0283	0.0007	0.0313
Long run	0.9920	0.0393	0.4067	0.0324

Sub-sample 1: Firms not reported to CR
Sub-sample 2: Firms reported to CR

Figure B.8: Dynamic path



Sub-sample 1: Lag coefficients



Sub-sample 2: Lag coefficients

Table B.9: Effect of subsidies on prices
Dep. var: Average interest rate on non-subsidised loans

	Sub-sample 1		*Sub-sample 2*	
	Coeff.	*St. err.*	*Coeff.*	*St. err.*
tme_nc(-1)	0.4290***	0.0383	0.5419***	0.0153
tme_nc(-2)	0.1489***	0.0262	0.0690***	0.0107
tme_nc(-3)	0.0355	0.0241	0.0065	0.0089
sub	0.1231***	0.0261	0.2918***	0.0144
sub (-1)	-0.0147*	0.0079	-0.0499***	0.0078
sub (-2)	0.0060	0.0066	0.0133**	0.0061
sub (-3)	0.0008	0.0034	0.0022	0.0043
pgar	-0.0394	0.1428	-0.2224***	0.0454
mat_ns	0.0007***	0.0000161	0.0004***	3.95e-06
t_rif	0.8933***	0.0996	0.7738***	0.0308
perflo	0.3208**	0.1467	0.4055***	0.1146
srv_h	0.0074	0.0147	0.0430***	0.0051
	Sargan test	385.1	*Sargan test*	333.3
	(355)	[0.130]	(355)	[0.790]
	m_1	-3.509** [0.000]	m_1	-11.14** [0.000]
	m_2	-1.201 [0.230]	m_2	-0.696 [0.485]

	Sub-sample 3	
	Coeff.	*St. err.*
tme_nc(-1)	0.7619***	0.0471
tme_nc(-2)	0.0098	0.0463
tme_nc(-3)	0.0853*	0.0441
sub	0.1308***	0.0357
sub (-1)	-0.0278**	0.0093
sub (-2)	0.0239***	0.0065
sub (-3)	-0.0619	0.0484
pgar	-0.3237**	0.1542
mat_ns	0.0002***	8.59e-06
t_rif	0.2641**	0.1006
perflo	0.8132	0.6489
srv_h	0.0924***	0.0200
	Sargan test	340.5
	(355)	[0.701]
	m_1	-8.543***
		[0.000]
	m_2	-1.235
		[0.217]

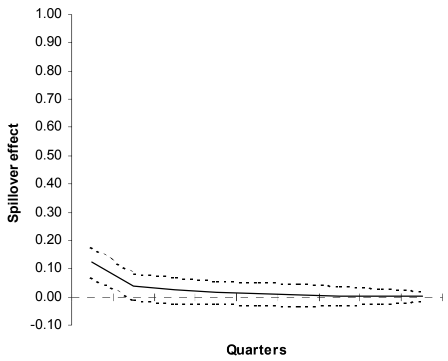
Sub-sample 1: New clients
Sub-sample 2: Medium length relationship clients
Sub-sample 2: Old clients

Table B.10: Dynamic response of prices to subsidies

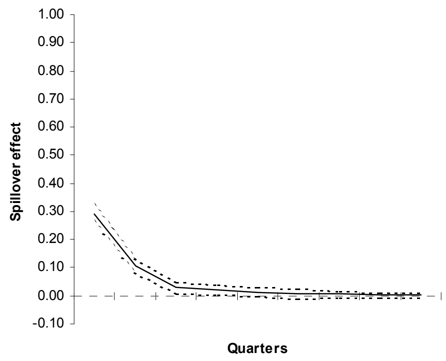
	Sub-sample 1		*Sub-sample 2*		*Sub-sample 3*	
time	*Lag coeff.*	*st. err.*	*Lag coeff.*	*st. err.*	*Lag coeff.*	*st. err.*
t	0.1231	0.0261	0.2919	0.0144	0.1308	0.0357
t+1	0.0381	0.0233	0.1082	0.0115	0.0719	0.0256
t+2	0.0238	0.0230	0.0280	0.0104	0.0232	0.0255
t+3	0.0159	0.0203	0.0227	0.0092	0.0184	0.0250
t+4	0.0104	0.0200	0.0142	0.0082	0.0142	0.0246
t+5	0.0068	0.0206	0.0093	0.0088	0.0110	0.0219
t+6	0.0045	0.0163	0.0060	0.0052	0.0085	0.0192
t+7	0.0029	0.0127	0.0039	0.0052	0.0066	0.0158
t+8	0.0019	0.0090	0.0025	0.0041	0.0051	0.0190
Long run	0.2982	0.0412	0.7260	0.0289	0.4546	0.0590

Sub-sample 1: New Clients
Sub-sample 2: Medium length relationship Clients
Sub-sample 3: Old Clients

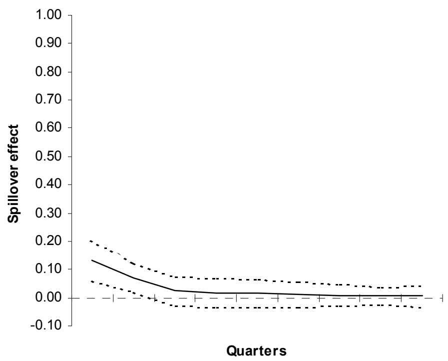
Figure B.10: Dynamic path



Sub-sample 1: Lag coefficients



Sub-sample 2: Lag coefficients



Sub-sample 3: Lag coefficients

Table B.11: Effect of subsidies on prices
Dep. var: Average interest rate on non-subsidised loans

	Sub-sample 1		*Sub-sample 2*	
	Coeff.	*St. err.*	*Coeff.*	*St. err.*
tme_nc(-1)	0.4633***	0.0405	0.2385***	0.0292
tme_nc(-2)	0.0826***	0.0292	0.0691***	0.0184
tme_nc(-3)	0.0279	0.0253	0.0459**	0.0170
sub	0.3300***	0.0241	0.1947***	0.0288
sub (-1)	0.0112	0.0069	0.0020	0.0081
sub (-2)	-0.0181**	0.0071	0.0131**	0.0064
sub (-3)	0.0116**	0.0048	-0.0083**	0.0037
pgar	-0.2346**	0.1042	-0.2741*	0.1536
mat_ns	0.0004***	0.0000111	0.0005***	0.000011
t_rif	0.8534***	0.0974	1.1825***	0.0937
perflo	0.2627	0.2157	0.8367**	0.3658
srv_h	0.0005	0.0136	0.0635**	0.0217
	Sargan test	342.2	*Sargan test*	304.9
	(355)	[0.678]	(355)	[0.974]
	m_1	-2.619**	m_1	-4.058***
		[0.009]		[0.000]
	m_2	-1.703	m_2	3.347
		[0.089]		[0.729]

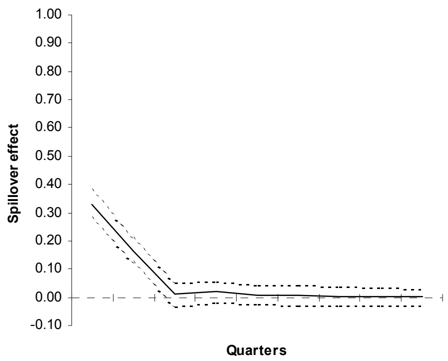
Sub-sample 1: Less financially constrained firms
Sub-sample 2: More financially constrained firms

Table B.12: Dynamic response of prices to subsidies

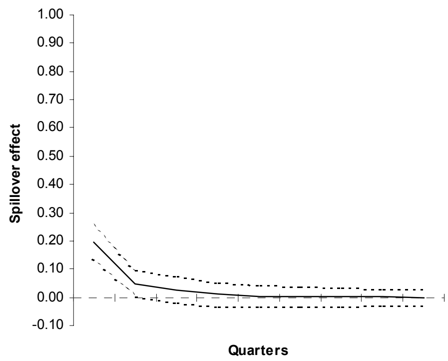
	Sub-sample 4		*Sub-sample 5*	
time	*Lag coeff.*	*st. err.*	*Lag coeff.*	*st. err.*
t	0.3299	0.0241	0.1947	0.0288
t+1	0.1641	0.0211	0.0485	0.0231
t+2	0.0109	0.0213	0.0267	0.0230
t+3	0.0186	0.0197	0.0097	0.0203
t+4	0.0095	0.0171	0.0042	0.0189
t+5	0.0060	0.0175	0.0025	0.0187
t+6	0.0035	0.0165	0.0013	0.0173
t+7	0.0021	0.0152	0.0007	0.0153
t+8	0.0013	0.0153	0.0004	0.0153
Long run	0.7852	0.0502	0.3117	0.0412

Sub-sample 1: Less financially constrained firms
Sub-sample 2: More financially constrained firms

Figure B.12: Dynamic path



Sub-sample 1: Lag coefficients



Sub-sample 2: Lag coefficients

Table B.13: Effect of subsidies on prices
Dep. var: Average interest rate on non-subsidied loans

	Sub-sample 1		*Sub-sample 2*	
	Coeff.	*St. err.*	*Coeff.*	*St. err.*
tme_nc(-1)	0.2837***	0.0301	0.5671***	0.0434
tme_nc(-2)	0.1199***	0.0202	-0.0332	0.0439
tme_nc(-3)	0.0921**	0.0205	0.0609*	0.0333
sub	0.4434***	0.0187	0.1507***	0.0172
sub (-1)	-0.0121	0.0072	0.0053	0.0325
sub (-2)	0.0102*	0.0186	0.0282	0.0333
sub (-3)	-0.0172*	0.0097	-0.0174	0.0156
pgar	-0.1497*	0.0783	-0.3552	0.2032
mat_ns	0.0005***	0.000006	0.0005***	0.0001
t_rif	0.5303***	0.0119	0.5355***	0.0111
perflo	0.8184**	0.2883	2.4807**	0.8806
srv_h	0.0006***	0.0001	0.0524**	0.0192
	Sargan test (355)	370.8 [0.271]	*Sargan test* (355)	370.9 [0.270]
	AR(1) test	-2.855** [0.004]	*AR(1) test*	-6.140*** [0.000]
	AR(1) test	0.3349 [0.3689]	*AR(1) test*	-0.7097 [0.478]

	Sub-sample 3		*Sub-sample 4*	
	Coeff.	*St. err.*	*Coeff.*	*St. err.*
tme_nc(-1)	0.2179***	0.0215	0.4960***	0.0342
tme_nc(-2)	0.1115***	0.0145	0.0605**	0.0263
tme_nc(-3)	0.0761***	0.0145	0.0477**	0.0232
sub	0.3118***	0.0202	0.2417***	0.0217
sub (-1)	-0.1347***	0.0270	-0.0423	0.0346
sub (-2)	-0.0214	0.0206	0.0173	0.0272
sub (-3)	0.0406**	0.0133	-0.0037	0.0174
pgar	-0.0709	0.0720	-0.2953*	0.1513
mat_ns	0.0008***	0.00004	0.0006***	0.00007
t_rif	0.5386***	0.0088	0.4877***	0.0470
perflo	0.0983	0.1477	0.9636**	0.4096
srv_h	0.0004***	0.0001	0.0683***	0.0141
	Sargan test (355)	340.8 [0.697]	*Sargan test* (355)	379.6 [0.178]
	AR(1) test	-4.220*** [0.000]	*AR(1) test*	-4.911*** [0.000]
	AR(1) test	-1.643 [0.100]	*AR(1) test*	-1.067 [0.286]

Sub-sample 1: Monopolistic markets and firms with internal score equal to 0
Sub-sample 2: Monopolistic markets with internal score greater than 0
Sub-sample 3: Non Monopolistic markets and firms with internal score equal to 0
Sub-sample 4: Non Monopolistic markets and firms with internal score greater than 0

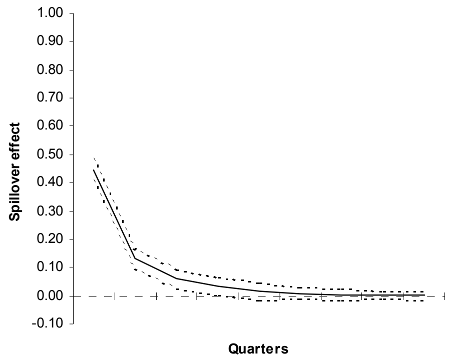
Table B.14: Dynamic response of prices to subsidies

	Sub-sample 1		*Sub-sample 2*	
time	*Lag coeff.*	*st. err.*	*Lag coeff.*	*st. err.*
t	0.4434	0.0187	0.1507	0.0172
t+1	0.1331	0.0178	0.0908	0.0160
t+2	0.0605	0.0166	0.0237	0.0166
t+3	0.0331	0.0154	0.0104	0.0161
t+4	0.0166	0.0155	0.0051	0.0159
t+5	0.0087	0.0099	0.0026	0.0158
t+6	0.0045	0.0099	0.0013	0.0150
t+7	0.0023	0.0074	0.0006	0.0146
t+8	0.0012	0.0073	0.0003	0.0138
Long run	0.8720	0.0456	0.4117	0.0565

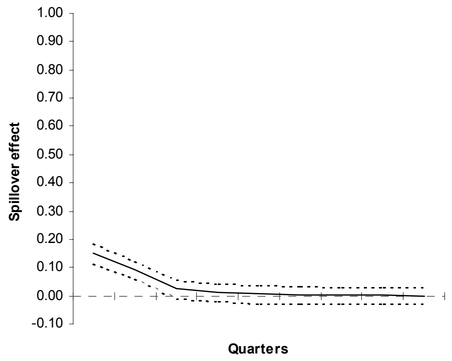
	Sub-sample 3		*Sub-sample 4*	
time	*Lag coeff.*	*st. err.*	*Lag coeff.*	*st. err.*
t	0.3118	0.0202	0.2417	0.0217
t+1	0.2026	0.0198	0.0776	0.0237
t+2	0.0406	0.0189	0.0287	0.0196
t+3	0.0315	0.0188	0.0189	0.0186
t+4	0.0114	0.0177	0.0111	0.0165
t+5	0.0060	0.0145	0.0067	0.0166
t+6	0.0026	0.0150	0.0040	0.0156
t+7	0.0012	0.0154	0.0024	0.0165
t+8	0.0006	0.0159	0.0014	0.0148
Long run	0.7833	0.0406	0.5384	0.0349

Sub-sample 1: Monopolistic markets, firms with internal score equal to 0
Sub-sample 2: Monopolistic markets, firms with internal score greater than 0
Sub-sample 3: Non Monopolistic markets, firms with internal score equal to 0
Sub-sample 4: Non Monopolistic markets, firms with internal score greater than 0

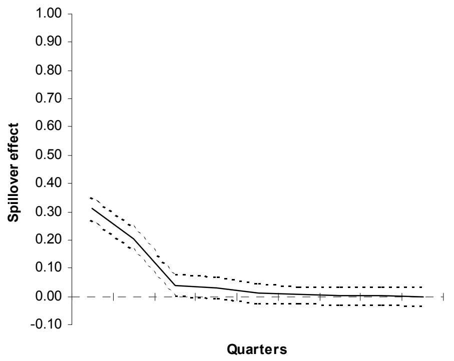
Figure B.14: Dynamic path



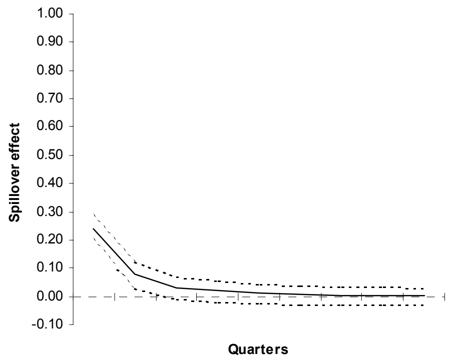
Sub-sample 1: Lag coefficients



Sub-sample 2: Lag coefficients



Sub-sample 3: Lag coefficients



Sub-sample 4: Lag coefficients

11 Appendix 5. Descriptive Statistics

Table 1.	Total existing clients			Subsidised clients		
	Mean	Std.Dev.*	No.obsv.	Mean	Std.Dev*	No.obsv.
Age (years)	16.91	11.85 12.50	69,352 4,360	18.41	12.59 11.73	11,824 956
Female owned firms (%)	11.46	-	7,259	10.72	-	4,187
Limited liability companies (%)	10.23	-	6,478	3.5%	-	1,354
Internal score	.55	1.55 .98	854,347 63,319	.41	1.41 .88	505,711 39,038
Total loans by Bank	92.23	255.05 225.60	854,347 63,319	68.00	186.21 181.91	505,711 39,038
Total subs. loans by Bank	-	-	-	47.28	90.41 84.85	505,711 39,038
Total loans by banking system	1,976.94	4,843.25 4,666.57	144,779 14,945	1,440.86	4,432.76 4,602.06	56,049 7,281
No. of bank lenders	2.58	7.78 6.37	144,779 14,945	1.15	1.03 1.29	56,049 7,281
No. of loans	2.21	1.97 1.56	854,347 63,319	1.95	1.57 1.62	505,711 39,038
Average interest	12.54	3.64 3.31	815,958 61,520	12.05	3.38 3.13	471,153 37,243
Average non- subs. interest	12.96	3.85 3.63	475,461 41,524	12.32	3.84 3.79	130,656 15,175
Fraction of subs.interest	-	-	-	.66	.20 .21	219,926 22,260
Collateralised loans (%)	.51	.46 .41	854,347 63,319	.52	.45 .40	505,835 39,054
Total sales (ml Liras)	7,805.107	29,591.29 31,054.59	91,085 6,449	2,576.81	11,918.10 16,636.85	15,309 1,277
Leverage	.62	.28 .27	88,360 6,312	.59	.27 .26	16,793 1,370
Collateralised value of assets	.70	.38 .36	95,175 6,662	.85	.38 .35	16,807 1,383
"Cash Flow"	.92	.35 .31	94,295 6,436	.92	.35 .32	15,751 1,283
Trade debt over total debt	.41	.27 .27	73,402 5,268	.31	.24 .24	12,287 1,083

* *Total Standard deviation on the first line in each cell, and within groups standard deviation on the second line.*

Table 2.	**Number of total new relations**			**Amount of total new subsidised loans (million Liras)**		
		Relations born with a subsidy			**New subsidised loans to new clients**	
1994/III	467	42	(8.9)	9,386.29	1,021.57	(10.88)
1994/IV	782	404	(51.6)	89,683.59	9,620.57	(10.73)
1995/I	400	52	(13.0)	128,527.53	6,362.03	(4.95)
1995/II	412	65	(15.7)	34,627.05	2,670.43	(7.71)
1995/III	341	58	(17.0)	15,992.8	2,294.59	(14.35)
1995/IV	434	213	(49.0)	109,153.44	58,92.57	(5.40)
1996/I	371	73	(19.6)	81,429.59	2,916.88	(3.58)
1996/II	418	190	(45.5)	48,170.64	5,936.44	(12.32)
1996/III	417	266	(63.8)	34,569.69	8,662.12	(25.06)
1996/IV	370	197	(53.2)	152,217.12	6,779.12	(4.45)
1997/I	380	163	(42.9)	29,048.27	4,451.51	(15.32)
1997/II	431	222	(51.5)	35,574.2	7,601.80	(21.37)
1997/III	325	148	(45.5)	35,300.62	8,938.10	(25.32)
1997/IV	435	183	(42.1)	55,746.45	11,222.02	(20.13)
1998/I	470	198	(42.1)	48,207.65	8,598.10	(17.83)
1998/II	608	304	(50.0)	64,498.8	15,295.10	(27.71)
1998/III	418	221	(52.9)	43,235.16	7,539.96	(17.45)

Table 3	Clients born with a subsidy			Clients born without a subsidy		
	Mean	Std.Dev.	No.obsv.	Mean	Std.Dev	No.obsv.
Age	8.66	4.74	37	11.67	12.30	568
Female owned firms (%)	13.63	-	409	13.59	-	601
Limited liability companies (%)	2.80	-	84	20.97	-	927
Total sales (ml Liras)	2,510.2	9,354.2	53	8,795	35,550	826
Total loans by Bank (ml Liras)	28.47	85.80	2,996	45.59	166.93	4,389
Total loans by banking system	876.29	5,421.81	116	1,208.28	6,253.27	481
Number of bank lenders	1.12	.83	116	3.62	5.98	481
Number of loans	1.08	.30	2,999	1.14	.49	4,420
Average interest rate	8.6	3.98	2,999	13.4	4.95	4,420
Collateralised loans (%)	.70	.77	2,999	.70	1.68	4,420