



Universidad Nacional de La Plata

**Departamento
de
economía**
*Facultad de Ciencias Económicas
Universidad Nacional de La Plata*

What Determines the Access to Credit by SMEs in Argentina?

Ricardo N. Bebczuk

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Comments welcome at ricardob@lpsat.com or ricardob@cfsargentina.org

What Determines the Access to Credit by SMEs in Argentina?

Ricardo N. Bebczuk
Department of Economics
Universidad Nacional de La Plata
Argentina

Abstract

This work discusses the determinants of the access to credit for a sample of about 140 Argentine small and medium firms, based on a unique database gathered by the Union Industrial Argentina in 1999. Among other findings, the evidence shows that the acceptance of overdraft lines at high interest rates and very short maturity is an important factor regarding the probability of getting a bank loan, while the availability of collateral does not seem to affect such probability. All in all, the results appear to be consistent with a risk taking behavior by banks in their loan policy toward this set of firms, an observation seemingly at odds with the conservative strategy that presumably banks follow.

1. Introduction

It is often claimed that small and medium enterprises (SMEs) face serious difficulties when trying to access credit markets. However, supporting econometric evidence is very scarce (for the U.S., a notorious exception is Petersen and Rajan (1994)). In the case of Argentina, no work has yet been produced to address this issue.¹ This section intends to contribute to this literature by exploiting a unique questionnaire and a database assembled by the *Unión Industrial Argentina* in 1999.

2. Estimation

The central piece of information is a questionnaire on credit operations carried out in 1998, and filled out by 665 SMEs (over a total of about 1,000 mailings) from different cities and regions of the country during May and June 1999. The sample only includes firms with fewer than 230 employees and sales below U\$S 42.7 million. Although other questions were formulated, the more relevant to this paper are summarized in the following table along with the responses given:

TABLE 1
Responses to the Survey

Category	Number of Observations	As a percentage of Total responses
Total responses	665	100.0
Applied and obtain loan	408	60.7
Applied but did not obtain loan	59	8.8
Did not apply	198	29.5
High cost of credit	96	14.3
High leverage	11	1.6
Bank debt is too risky	66	9.8
Does not meet bank's Requirements	73	10.9

¹ Recent papers that attack credit-related issues for SMEs in Argentina using the Central Bank and focusing on the effect of bank ownership structure in Argentina are Burdisso et al. (2001) and Berger et al. (2001).

The questionnaire is well-fitted to run a logit regression analysis aimed at identifying the determinants of SME access to a credit loan, where the dependent variable is a binary one: firms asking and getting credit are assigned a value of 1 and 0 otherwise. In spite of having 665 responses, the analysis will be limited only to the 140 firms that provided complete balance sheet information for 1998.

The explanatory variables to be used are the following:

(a) *Sales*: This is a proxy for size. The bigger the firm, the lower the probability of default, which in turn is related to higher diversification, availability of collateral, or commercial success. As a result, its expected effect on the probability of obtaining credit is positive. Sales corresponds to total sales between January and December 1998.²

(b) *Length of lending relationship with the main bank*: As demonstrated by Rajan (1992) and Petersen y Rajan (1994), among others, a long lending relationship reduces the severity of the informational asymmetries experienced by the bank by providing it with information on the borrower's credit history, her account movements, and the personal behavior of the firm's manager. Consequently, the expected sign is positive.

(c) *Lending relationship with a mutual bank*: Due to its smaller customer base and its more personalized approach to clients, mutual banks (*bancos cooperativos*) are likely to be more willing to provide credit to SMEs with good investment opportunities. It is measured through a dummy variable, taking the value 1 if the firm operates with a mutual bank and 0 otherwise.

(d) *Use of overdraft*: According to the casual observation and the results of the questionnaire, many SMEs use these credit lines which, as is well known, are short-term, and set at a variable and high interest rate.³

Its influence is not clear a priori. On the one hand, the higher the interest rate and the shorter the maturity, the better equipped the bank is to overcome its informational disadvantage –the high interest rate serves to cover the equally high

² It may be argued that since all the firms in the sample are small, it is not clear that the size effect will be relevant in this case. However, it must be taken into account that in the usable sample sales range from 0.17 to 27.3 million dollars.

³ Out of the 665 firms, 241 asked for an overdraft line and 58 accepted it as a condition imposed by the bank. As for the sample of 143 firms with complete information, the proportions are similar: 70 asked for it and 10 accepted the bank's proposal. A comment is in order: it is hard to admit that a firm would

repayment risk and the short term allows the bank to promptly cut credit whenever bad news arrives or uses its ability to cancel it as a disciplinary device. But on the other hand, a high interest rate exacerbates the emergence of moral hazard inducing firms to undertake riskier projects. Furthermore, under a high and variable rate arrangement, the firm becomes more vulnerable to adverse shocks. It is measured through a dummy variable, taking the value 1 if the firm took an overdraft line (either out of its own willingness or owing to the bank's imposition) and 0 otherwise.

(e) *Expectation of firm's export growth*: The firm's export performance may convey valuable information to the bank: in the first place, it reveals the degree of competitiveness in usually aggressive markets; in the second place, it is an indicator of productive diversification against domestic shocks. In sum, the probability of default is likely to be lower for this segment of firms, provided the bank trusts or confirms the firm's expectation. It is measured through a dummy variable, taking the value 1 if the firm declares to be expecting an increase in its exports and 0 otherwise.

f) *Expectation of investment expenditures*: The interpretation is similar to the previous one, but it is more applicable to nontradable producers. These firms are expected to be doing well and then to enjoy better financial access. It is measured through a dummy variable, taking the value 1 if the firm declares it is expecting a production increase and 0 otherwise.

(g) *Term of commercial credit provided to clients*: Given the high cost of external funds for SMEs, both the bank and the firm are aware that few productive projects are likely to be financed via bank loans. On the contrary, commercial credit to clients is usually pacted at high interest rates, especially when clients are in turn SMEs or individual consumers. As measured by the above-mentioned variable, if the firm is actively engaged in this type of commercial credit, then its probability of obtaining a loan is expected to be higher.⁴

In addition to these variables, the following ones taken from the balance sheet will be employed:

prefer this unfavorable type of credit, so it is likely that most overdraft operations are in one way or another induced by the bank.

⁴ It must be noted that other variables measuring the role of commercial credit were empirically tested (for example, accounts receivable to assets, receivable minus payable to assets, difference between term on receivable and on payable), but none of them appeared to have enough explanatory power.

(h) *Return on assets*: The higher this variable, the lower the probability of default and therefore the higher the probability of obtaining a loan.⁵

(i) *Availability of fixed assets*: Fixed assets can be used as collateral, thereby reducing the bank's potential losses for a given interest rate and discouraging moral hazard behavior. It is measured by its ratio to total assets.

(j) *Liquidity*: The ratio cash to total assets has a priori two negative effects on the probability of getting a loan.⁶ First, the more liquid the assets are, the easier it is for the borrower to withdraw the money from the firm when default is imminent. Second, possessing high levels of cash may lead the banker to believe the firm intends to transfer its own risk to the lender in the event of default.

(k) *Debt over assets*: This variable has an ambiguous effect since, although it increases the probability of default, it also reveals that prior lenders have found the borrower reliable enough. Presumably, the lower the debt ratio, the more likely it is for the second effect to prevail.⁷

Descriptive statistics on most of these variables appear in Table 6:⁸

TABLE 2
Descriptive Statistics

Variable	Total n=143	Applied for and obtain loan n=92	Applied for but did Not obtain loan n=11	Did not apply n=39
Length of client relationship	19.6 12.5	20.3 12.3	17.1 11.4	18.9 13.5

⁵ Empirical work shows that the return on assets tends to reduce the debt-equity ratio. But here we are assuming that the decision to take new debt has already been made, so we are trying to unveil the factors behind the lender's decision. Another point here is that the lender makes his decision based on the expected value, but we only have the contemporaneous return on assets. Accordingly, we should assume that he has perfect foresight.

⁶ It is true that liquidity may proxy for high cash flow, but this effect is already captured by the volume of sales and the return to assets.

⁷ This reasoning suggests that there may be a non-linearity. However, in the actual estimations, the square of the debt ratio displayed a negative but non-significant coefficient.

⁸ For comparison purposes, note that the average debt ratio is much lower than in the case of the big firms, as shown in the Introduction. This, along with the high cost of overdraft, reveals in a first approximation that SMEs are relatively more financially constrained.

Age	33.0 19.8	31.1 15.1	25.7 10.7	38.9 28.6
Return on assets	8.0 17.2	9.7 10.7	5.0 11.0	5.1 27.8
Cash/Total Assets	10.3 10.0	8.7 8.1	7.4 9.2	14.9 12.8
Sales (million of pesos)	3.9 4.2	4.2 4.6	3.7 2.9	3.0 3.4
Fixed Assets / Assets	31.2 19.3	31.0 17.3	36.4 23.6	30.8 22.4
Debt / Assets	13.3 26.2	16.9 30.9	15.0 14.8	4.5 10.1
Overdraft monthly cost (n=69)	2.5 1.1			

Note: for each variable, the first column represents the average and the second the standard deviation.

As a first approximation, the dependent variable should include only the firms that have applied for a loan, but not those that have decided not to do it. Otherwise, supply and demand factors would not be clearly distinguished. However, this approach may be misleading once firms in this last group may have decided to stay out of the credit market because they anticipate that the bank is likely to reject their application. The fact that just 8.8% of the 665 firms and 7.7% of the 143 ones with complete balance sheet information have been rejected indicates that there is some auto-selection bias –knowing the financial constraints faced by SMEs, these figures appear to be strikingly low. As a matter of fact, as shown in Table 6, firms offer the reason or reasons that led them not to apply. But it is unclear that the categories included provide a reliable guide as to whether it was a lack of demand for credit or just the educated guess that the application (which in itself is costly), would be rejected.

For this reason, besides using the whole sample and the one excluding the third group (firms that did not apply at all), a new dependent variable will be tested by excluding only the firms with above-average return to assets and below-average debt to assets ratio. This procedure tries to unveil the revealed preference of the firms: Since highly profitable firms are unlikely to be rejected by the bank, the fact that they display a low level of debt and refuse to apply for a loan may be suggesting that, unlike the other firms, they do not need external funding or prefer to pass up good

projects instead of resorting to a new loan. In this way, 17 firms out of the 143 have been eliminated; for this group, the average return to assets is 23.1% and the debt to assets 0.6% (only 4 out of the 17 firms display any debt at all).

Estimation results are presented in Table7:

TABLE 3
Estimation Results

Dependent variable: Probability of obtaining credit

Variables	(1)	(2)	(3)
Length of client relationship	0.035 (1.579)	0.026 (0.749)	0.036 (1.297)
Return on assets	0.061 (2.355)	0.087 (1.795)	0.137 (3.143)
Cash/Total Assets	-7.655 (-2.109)	-4.206 (-0.696)	-9.262 (-1.942)
Sales (million of pesos)	0.160 (0.378)	0.947 (1.135)	0.715 (1.246)
Fixed Assets / Assets	0.306 (1.123)	1.264 (1.257)	0.781 (1.593)
Client of mutual association bank (dummy)	1.409 (2.216)	1.213 (1.240)	1.244 (1.540)
Debt / Assets	6.606 (2.528)	5.388 (1.341)	5.660 (1.878)
Expectation of export growth (dummy)	1.544 (1.582)	1.141 (0.868)	2.207 (1.519)
Average financing term to clients	0.015 (2.124)	0.016 (1.445)	0.014 (1.761)
Expectation of investment growth (dummy)	-0.989 (-0.962)	-0.753 (-0.678)	-1.658 (-1.366)
Applied for or accepted overdraft	2.048 (3.816)	0.027 (0.035)	1.214 (1.941)
Constant	-6.355 (-1.653)	-5.493 (-0.887)	-7.411 (-1.510)
No. de observations	139	95	122
Chi-square	76.4	12.96	66.53
p-value	0.000	0.451	0.000
Seudo R ²	0.418	0.180	0.461

(1) All observations included

(2) Firms that did not apply excluded

(3) Firms with ROA below average and debt over assets above assets excluded

For the previous reasons, we consider that results of regressions (1) and (3) are the most reliable. Accordingly, the main lessons drawn from the estimation are:

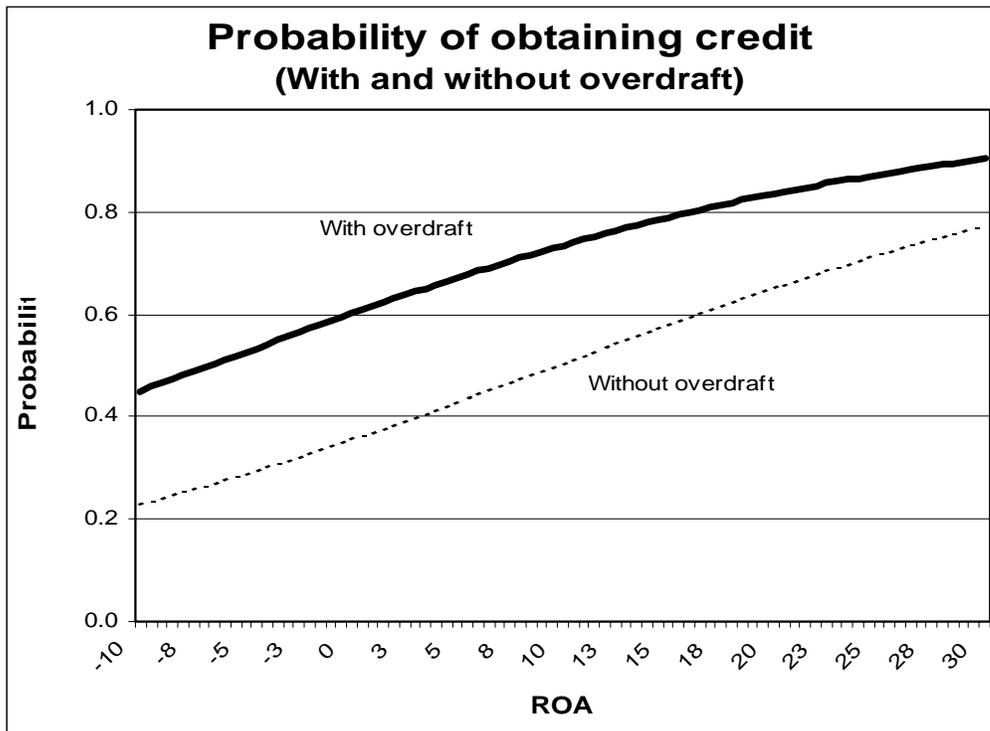
- Once other control variables have been taken into account, the firm size does not appear to have any significant influence on the probability of obtaining a loan. This indicates that no unjustified financial discrimination seems to be taking place against SMEs, as often argued in business circles and the press.
- More profitable firms have a higher probability of obtaining a loan.
- The higher the liquidity, the lower the probability. A priori, this evidence would suggest that there is a chance that the owner may misuse the firm's funds in a financial distress scenario.
- The higher the debt ratio, the higher the probability. The explanation behind this finding is that the prior access to debt conveys positive information to a new potential lender. Presumably, this effect would be somewhat neutralized for high levels of debt, but in the sample at hand the debt ratio is quite low.
- The length of the lending relationship also has a positive, but not statistically significant, effect on the probability of obtaining a loan.
- The use of overdraft credit also increases this probability, which would suggest that there is no credit rationing à la Stiglitz-Weiss. A plausible explanation is that banks take SMEs lending as a high risk/high return investment of their portfolio.
- Tangibility does not appear to have any significant impact, which would reinforce the argument according to which banks are willing to take a risky position when making loans to SMEs.⁹
- Expectation of higher investment or exports does not appear to affect the probability of getting a loan. It is reasonable to interpret this fact as an indication that, given the high cost and short term of credit lines, SMEs use bank loans to fund trade credit or unexpected expenses rather than productive assets.

In order to evaluate the actual quantitative impact of the significant variables on the probability of obtaining a loan, marginal probabilities were calculated for the statistically significant variables, which all seem to exert a noticeable effect on the probability under study:

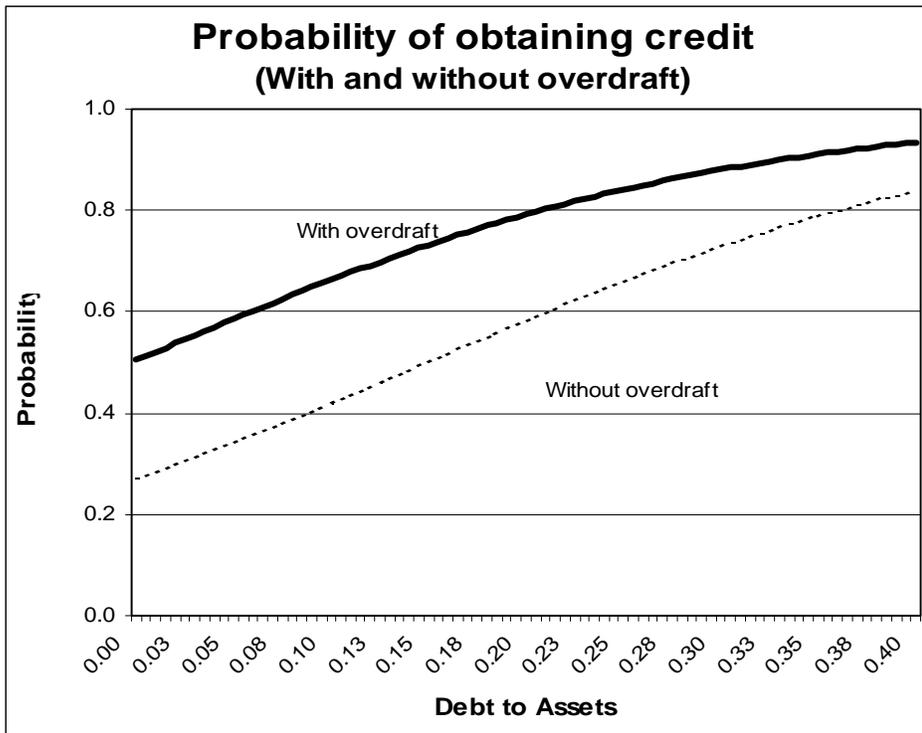
⁹ The lack of statistical significance of fixed assets does not necessarily imply that the firm does not offer collateral, since the owner may use personal assets. But in such a case it would be difficult to understand why its borrowing is as scarce and expensive as shown by the results of the survey.

Furthermore, Graphs 1 and 2 (based on the whole sample results) exhibit the changes in probability for different values of the return to assets and the ratio debt to assets, assessing also the role of overdraft, showing that overdraft becomes more important in terms of the probability of getting credit at low levels of profitability and leverage:

Graph 1



Graph 2



3. Concluding remarks

Based on a unique information set for the late 90s, this paper provides several insights on the determinants of the access to credit on the part of small and medium enterprises in Argentina. Some provocative results that deserve further investigation are the negative impact of liquidity on the probability of getting credit, the lack of statistical significance of asset tangibility, and the effect of overdraft to facilitate the external financing of SMEs. Besides its eventual use to design public policies directed to this sector, this work might help to grasp a better understanding of bank behavior toward this segment of firms.

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ANNEX: A Simple Model on SME Lending and Bank Behavior

According to the empirical model just developed, banks prefer to lend via overdraft facilities at very high interest rates and short term, and do not take into account whether the firm has collateralizable assets. These selection criteria suggest that banks are not particularly willing to scrutinize and monitor these lenders, or to resort to mechanisms to minimize repayment risk.¹⁰ In other words, as far as SME lending is concerned, banks seem to be willing to take more risks in order to increase their expected return. This view partially clashes with the conventional wisdom asserting that banks may prefer rationing credit when interest rates go up and adverse selection problems are likely to arise.

In this Section we propose a simple model which helps to rationalize the observed behavior of banks. The main insight of this model is that well-diversified banks may have no incentives to reduce the risks associated to lending to SMEs. Let us assume that banks (or their depositors) are risk-averse and maximize expected utility, lending their deposits (normalized to one) to either big or small firms. There is a total of N firms, of which $N_s = n_s N$ are small and $N_b = n_b N$ are big. The return from lending to small and big firms is identically and independently distributed with expected value r_s and r_b , and variance σ_s^2 and σ_b^2 , with $r_s > r_b$ and $\sigma_s^2 > \sigma_b^2$. Maximizing the bank's expected utility requires finding the optimal share to invest in small and big firms, θ_s and $\theta_b = 1 - \theta_s$, respectively. Given the iid property (which makes it optimal to lend equal shares in each small firm, $1/N_s$, and each big firm, $1/N_b$) and assuming a quadratic utility function, the objective function is:

$$\text{Max}_{\theta_s} EU = \theta_s r_s + (1 - \theta_s) r_b - \frac{\gamma}{2} \left[\frac{\theta_s^2}{N_s} \sigma_s^2 + \frac{(1 - \theta_s)^2}{N_b} \sigma_b^2 \right]$$

which yields the following optimal share θ_s^* :

$$\theta_s^* = \frac{r_s - r_b}{\gamma \frac{1}{N} \left(\frac{\sigma_s^2}{n_s} + \frac{\sigma_b^2}{n_b} \right)} + \frac{\sigma_b^2 / n_b}{\left(\frac{\sigma_s^2}{n_s} + \frac{\sigma_b^2}{n_b} \right)}$$

The equation displays the standard result of the portfolio theory. The twist we want to introduce is that banks are able to reduce their perceived risk of lending to a small firm, σ_s^2 , by incurring some information costs c that take the form of a lower expected return, $(r_s - c)$. These costs include ex ante and ex post assessment and monitoring of the firm once standard information (balance sheets, credit history, projected cash flows) has been gathered and processed for both small and big firms. Given the opacity of small firms (and, in the Argentine case, a high degree of informality), it may include periodic meetings with management and employees, visits to the plant, and in general a close surveillance of the firm's activities.

¹⁰ Interviews with market participants confirm these findings.

For the purpose of this paper, the relevant question is, how much is the bank willing to pay to reduce σ_s^2 ? For a given θ_s^* , the required fall in variance for each unit of return lost is given by the following derivative:

$$\frac{\partial \sigma_s^2}{\partial c} = -\frac{Nn_s}{\gamma\theta_s} < 0$$

The bank will be less willing to pay for information the higher the number of borrowers and the group of small firms (which is a consequence of the higher ability to diversify risks both in general and within the latter group), and the lower the risk aversion and the portfolio share invested in small firms (in the latter case, because portfolio performance is less dependent on the risk and return of such small firms).

This model has a number of interesting and relevant corollaries to interpret the empirical findings just presented:

- As far as banks are able to diversify its loan portfolio among a considerable number of borrowers, they will have little interest in knowing more about SMEs borrowers, because information costs are likely to be high relative to benefits (especially when fixed costs are involved).
- When the portfolio is well-diversified, banks focus on the incremental expected return without much consideration to incremental risk (particularly when their investment in risky firms is low, as it is often the case). That helps explain why banks usually lend to SMEs through overdraft facilities at extremely high interest rates and short-term (this latter feature is likely explained by the desire to control moral hazard via staged finance).
- Given the concern for increasing return rather than reducing risk, banks are willing to lend to SMEs firms without collateralizable assets, as found in the regression.