WORLD BANK WORKING PAPER NO. 49

Enterprise Size, Financing Patterns, and Credit Constraints in Brazil

Analysis of Data from the Investment Climate Assessment Survey

Anjali Kumar
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THE WORLD BANK
Washington, D.C.

Manufactured in the United States of America
First Printing: April 2005

 printed on recycled paper

1 2 3 4 5 07 06 05

ISBN-10: 0-8213-6129-5 ISBN-13: 987-0-8213-6219-0
eISBN: 0-8213-6130-9 ISSN: 1726-5878
DOI: 10.1596/978-0-8213-6129-0

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Library of Congress Cataloging-in-Publication Data has been requested.

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Preface

This paper investigates the importance of firm size with respect to access to credit, relative to firm performance, and other factors which may affect creditworthiness, such as management education, location, or the industrial sector to which the firm belongs. The principal findings are that size strongly affects access to credit, compared to performance as well as other variables, suggesting quantitative limitations to credit access. Looking at short-versus long-term loans, the impact of size on access to credit is greater for longer-terms loans. Further, looking at the ownership of the lending institution, it is found that public financial institutions are more likely to lend to large firms. Finally, examining the role of financial constraints relative to other constraints faced by the firm, it is found however that financial access constraints may have a less significant differential impact across firms of different sizes than other constraints though cost of finance as a constraint is very important.

The authors are grateful to Thorsten Beck, Gledson Carvalho, Soumya Chattopadhyay, Marianne Fay, Luke Haggarty, Patrick Honohan, Leora Klapper, Leonid Koryukin, John Nasir, Maria Soledad Martinez Peria, Mark Thomas, and José Guilherme Reis for their valuable comments on earlier versions.

Introduction

Should firm size affect the ability of a firm to access external capital for growth? If access to external financing is based on current performance, or expected future performance—that is, on returns or expected returns—size *per se* should not have an impact on access to external finance. Yet in many countries it is perceived that small firms face particular disadvantages in the credit market.

This paper examines the extent to which firm size affects financing patterns and restricts access to finance in one country, Brazil, based on an Investment Climate Survey of 1642 firms constructed in 2003, which includes firms in thirteen Brazilian states (out of 27) and nine industrial groups. The following key questions are addressed: (i) whether small firms financing patterns differ from large firms, and whether small firms have less access to credit and face more credit constraints than larger firms; (ii) the importance of firm size, compared to performance, or other factors, in assessing access to credit and credit constraints; (iii) whether credit provision criteria are different for fixed capital (long-term loans) and for working capital (short-term loans), (iv) whether bank ownership—public, private or foreign—impacts differentially upon on credit provision across firm sizes, and (v) the role of credit constraints relative to other constraints, in relation to firm size.

The present section discusses the questions examined, reviews results of former studies on firm size and access to finance, and discusses the data sample and the variables used in the present investigation. Section 2 investigates financing patterns by firm size and analyzes differentials in access to credit, evaluating the role of size, among other factors, as a constraint to financial access. Section 3 examines the differential impact of financial institutions' ownership on the provision of credit to firms of different sizes. Section 4 investigates the role of financial access as a constraint to growth, relative to other factors, for firms of different sizes. Finally, Section 5 presents overall conclusions.

Firm Size, Performance, and Characteristics: Impact on Financing and Access to Credit

Studies of the extent to which firm size affects financing patterns, at the cross country level, have looked primarily at differentials in debt equity ratios, and results suggest that size does affect financing patterns (Demirguç-Kunt and Maksimovic 1999). Large firms have more long-term debt as a proportion of total assets compared to smaller firms, and are more likely to use external finance compared to small firms (Beck, Demirguç-Kunt, and Maksimovic 2002, 2003). More disaggregated investigations of sources of finance have also looked at the use of trade credit, finding that large firms are significantly associated with less trade credit finance (Demirguç-Kunt and Maksimovic 2001). The greater use that smaller firms make of trade credit is more prominent in countries where the legal infrastructure is weak. As the legal infrastructure strengthens, across a spectrum of countries, the use of trade credit is reduced for all firm sizes. Moreover, comparing bank financing and trade credit, these studies suggest that size plays a larger role in access to bank financing than in access to trade credit. In the present study, data from the Investment Climate Survey on Brazil permits disaggregation of sources of financing into a wider spectrum, beyond debt and equity finance, or bank finance versus trade credit. It also permits the separation of financing sources for short and long term capital.

In assessing the factors which would affect access to credit, traditional theory would suggest that in well-functioning credit markets, lenders would base their decisions on the overall financial soundness of firms and on expected performance and projected cash flows, adjusted for risks and transaction costs, rather than upon firm size. Measures readily available for expected performance, adjusted for risks, are difficult to construct, however at a very simple level, many authors have found that greater sales and profits are associated with greater access to credit (for example, Bigsten and others 2003; Topalova 2004). In addition, firms with increasing sales, increasing turnover (sales/assets) ratios, lower volatility of sales or lower liabilities to assets ratios, would be expected to have greater access to credit and less credit constraints.

Yet, empirical studies have also found that smaller and younger firms are more credit constrained than larger and long established firms. Bigsten and others (2003) also report that small firms are less likely to obtain a loan than large firms. Levenson and Willard (2000) find that constrained firms are smaller, younger, and more likely to be owned by their founders. Furthermore, Levy (1993) reports that lack of access to finance emerges as the binding constraint for smaller and less established firms.[1]

Several reasons have been pointed out why access to credit may be affected by firm size in addition to performance. First, greater constraints may be faced by small firms due to market imperfections, in the form of greater informational opacity. Though not unique to small firms, this may be considerably more relevant because of relatively poor quality and provision of financial information. This leads to greater difficulties in credibly conveying their quality or the quality of their projects (Binks and Ennew 1996). Small firms, and especially small young

1. This analysis presents however two caveats. One is that empirically it is difficult to disentangle creditworthy firms from non-creditworthy firms and therefore it is unclear if higher constraints are well justified or not. Moreover, a survival bias hides important information regarding non-surviving firms whose failure may result from credit constraint.

firms, lack the long credit history of larger and longer established firms. Also small firms do not have publicly-known contracts (supplier, customer, or labor-related), and do not trade securities that are continuously priced in public markets. Moreover, unlike large firms their performance is not regularly assessed by independent market analysts, and they may be unable to provide audited financial statements (Berger and Udell 1998; Saito and Villanueva 1981). External financial agents must consider the provision of finance under imperfect and asymmetric information (Berger and Udell 1994) related both to the *ex ante* evaluation of the project and the firm and the *ex post* monitoring of performance. Information is particularly important for debt financing, where the lender is not a beneficiary of upside gains, but is a potential loser in the event of downside firm failure. It has been argued that such information asymmetries, and thus adverse selection and moral hazard, lead to credit rationing (Stiglitz and Weiss 1981); a situation where, with a given total supply of credit, some entities are unable to obtain a loan at any interest rate. Such credit rationing may explain the credit constraints that small firms face (Lung and Wright 1999; Berger and Udell 1994).

Second, to the extent that the adverse effects of information asymmetry may be reduced by the provision of collateral (Angelini and others 1998; Berger and Udell 1994) it is argued that smaller firms face greater difficulties. Larger firms tend to own more assets for collateral. Also in large firms, managers' investments in the firm can also constitute a pledge of performance (Bester 1987; Binks and Ennew 1996). In the case of small (unlisted) firms pledged collateral is often of a personal nature (Avery and others 1998). Greater reliance on personal assets may discourage investments at the margin as they imply additional risk (Binks and Ennew 1996).

Third, in addition to informational opacity, small firms may be associated with real risk differentials compared to large firms, since they are known to have a high failure rate compared to larger firms (Lund and Wright 1999; Gertler and Gilchrist 1994). Small and especially new firms and may also have relatively more volatile earnings due to less opportunities for diversification of their output or client base (Chittenden and others 1993; Hughes and Storey 1994; Klapper and others 2002). Smaller firms may thus be less likely to survive economic downturns (Gertler and Gilchrist 1994). Evidence has shown that small business closures occur in the first three years of operations (Bank of England, 1994). By contrast, larger firms can potentially be more diversified and thus better protected against economic fluctuations (Brewer and others 1996; Saito and Villanueva 1981). Furthermore, larger firms are usually older and better established, which itself demonstrates their survival under market competition.

Such differences between large and small firms are translated into higher bank transaction cost of lending to small firms. These real transaction cost differentials refer to search, information, evaluation, monitoring as well as higher risk. Saito and Villanueva (1981) estimate the real cost of lending to small firms being approximately twice that of lending to large firms. In the present study, the extent to which small firms face greater credit constraints is empirically examined, and the importance of size differentials is compared with variables reflecting firm performance, adjusted as far as possible for risk.

Other Factors Affecting Access to Credit

Looking at other variables which could affect firms' access to finance, it has been suggested that there may be an "industry effect." Banks may favor firms of specific industries as clients,

lending more to 'growth' industries (Rajan and Zingales 1998). An alternative explanation for an industry effect is that some industries are more likely to depend on external financing than others, depending upon initial project scale, cash flows and requirements for continuing investment (Rajan and Zingales 1998; Bigsten and others 2002).[2] Industrial effects could thus be hypothesized to arise from factor intensity differentials, so that more capital-intensive firms, with higher credit needs, may face proportionally greater constraints.

There may also be a "regional effect" so that financial access differentials in different firm locations can arise from differentials in bank density across regions, which themselves may reflect differentials in income and levels of economic activity. In Brazil there are sharp income differences between the five main regions, where the Southeast is three times as rich as the Northeast in per capita income terms. Kumar and others (2004) find that there is a large variation in branch density across different regions of Brazil. While the South and Southeast are relatively well branched, access to bank branches is relatively limited in the North and Northeast. Well branched regions, and as a consequence, greater ratios of banks per firm would be expected to ease physical access and also lower information asymmetry problems and as a result ease credit access.[3]

Next, there may also be an "ownership" effect of the firm (private domestic, private foreign, or state) and credit access. Foreign firms may have more access to credit and less credit constraints than domestic private firms. Foreign firms are usually highly visible, well known and publicly listed and traded. Previous studies in Brazil suggest that foreign firms outperform domestic counterparts (Willmore 1986). State firms may have more credit access (especially from public banks) relative to private domestic and private foreign firms. If it is argued that state firms are generally obliged to make their financial situation public, decreasing the agency costs associated with information asymmetries, such firms would be expected to have superior access. One the other hand, if access to credit depends on performance, state owned firms have often been shown to perform less well than private firms (for example, Majumbar 1998; Vinning and Boardman 1992) which would suggest that state firms should be more credit constrained than private firms.

The extent to which different levels of managerial education affect access to credit and credit constraints is also explored. This has not been addressed in previous empirical studies. However, various authors have raised the importance of managerial education. Jensen and McGuckin (1997) maintain that variations in firm performance are largely associated not with traditional characteristics such as location, industry, size, age, or capital, but rather with intangibles specific to the firm such as the managerial capital of the firm or the skill of its workforce. At the individual level, Kumar (2004) found a strong education effect in explaining access to financial services in Brazil. We expect that firms with more educated managers have more access to credit than firms with less educated managers, as a result of their ability to smooth complicated loan application procedures, presenting positive financial information, and/or building closer relationships with banks. Furthermore, better educated managers are more likely to have managerial skills in finance, marketing production, and international business that would lead to firm's growth.

2. Another industry specific hypothesis could be to check for differential effects of government policies, which sometimes aim to promote specific sectors of the economy. In Brazil, government policy has offered credit incentives to export oriented industries for example.

3. A state level analysis is not attempted in this paper.

Bank Relationships, Bank Ownership and Access to Credit

Looking at the extent to which access to credit may be affected by the lender, studies have pointed out that closer banking relationships could reduce transaction costs that emanate from information asymmetries. Closer banking relationship can facilitate the flow of information between borrower and lender, easing the bank's assessment of managerial skills, business prospects, firm needs and resources. The better informed the bank the more it will be able to apply prospects-based lending methods rather than collateral-based lending (Binks and Ennew 1997). Closer relationships could be established through longer association, uniqueness of association, or interaction over multiple financial products, that allow the bank to learn about the firm's cash flows (Peterson and Rajan 1994). There is a broad empirical literature with evidence that closer relationships (length of the relationship or exclusive relations) are associated with lower credit constraints. Chakravarty and Scott (1999) find that the relationship duration and the number of activities between households and lenders significantly lower the probability of being credit-rationed. Cole (1988) finds that a lender is more likely to extend credit to a firm that has an existing savings accounts and other financial services. Also Peterson and Rajan (1994) report that the length of the relationship has a positive and significant impact on credit availability. Ferri and Messori (2000) report that close customer relationships between local banks and firms promote a better allocation of credit in the North and Center of Italy but worse in the South.[4]

One measure used to proxy the closeness of bank relationships is the extent to which such relationships are unique. Peterson and Rajan (1994) and Cole (1998) find that firms that borrow from multiple banks are charged at significantly higher rates and face lower availability of credit. These results are interpreted to suggest that multiple relationships decrease the value of the private information generated by the potential lender (Cole 1998). However, on the contrary, it has also been argued (Binks and Ennew 1996) that the vast majority of small firms do not need a close relationship with their banks because they require standard services. Furthermore they state that banks need to be selective when developing relationships since such services are costly in terms of people and time. The present paper investigates the extent to which unique banking relationships affect access to credit.

Another factor which may differentially affect access to credit for firms of different sizes may be the ownership of the lending financial institution. Foreign banks may provide more credit to large corporate firms for two reasons; first, foreign banks tend to "cherry pick" good clients with the offer of superior services, and second, foreign banks are usually located in large financial centers away from small firms (Berger, Goldberg, and White 2001; Clarke and others 2001). Clarke and others (2001, 2002) find that foreign bank penetration improves financing conditions for enterprises of all sizes, but this process seems to benefit

4. There are also studies that focus on the role of firm-lender relationships and the *pricing* of credit. In Diamond (1989), Peterson and Rajan (1993), and Boot and Thakor (1994) it is predicted that loan interest rates should decline over time though Greenbaum et al. (1989), and Sharpe (1990) maintain that lenders charge lower interest rates in early periods. Empirically, studies have found contradictory results. Peterson and Rajan (1994) find that the length of the relationship has no effect on the cost of credit. Berger and Udell (1995) find that the cost of borrowing in credit lines decreases with long term bank—borrower relationships and that collateral is less frequently required. The impact of bank relationships and the cost of credit is not examined in the present study.

larger firms more. Public banks on the contrary may have a closer association with small firms as they are often mandated to ease credit to small and new firms as a mean of overcoming perceived market failures.

Other Factors Affecting Access to Credit

Heterogeneity of firms in terms of access to credit may also arise due to other characteristics, which we broadly group under three categories: competitiveness, credibility, and capacity for innovation. Competitiveness may be reflected in age, where survival suggests that firms are at least as competitive on average, as other existing firms. Being an older firm should also lower informational opacity (Frazer 2004).[5] Another indicator of competitiveness, in a global sense, is whether firms are exporters or not. Firms' transparency and credibility should clearly affect their access to credit, and some researchers have pointed out that formal sector firms may be deemed more transparent, or firms which are members of a group or trade association (Binks and Ennew 1996). Finally, innovation and technological change are majors drivers of economic growth (Solow 1957). At the firm and industry level, recent contributions have found strong links between technological change and productivity, and between R&D and a firm's growth (Long and others 2003; Griliches 1998, for a survey). Innovative capacity may be suggested by the education of the workforce as human capital influences growth (Barro and Sala-i-Martin 1995), Lucas (1988), and Romer (1990). The results of Laursen and others (1999) corroborate this thesis. They find that the availability of a high fraction of employees with higher education was in general conducive to growth.

Data and Sample Characteristics

Table 1 summarizes the sample composition according to region, industry, ownership, manager's education, and sales growth. Looking at a simple parameter to measure firm performance, about 65 percent of firms claimed to have increasing sales over the reference period. In terms of region, firms are located mainly in the more affluent South and Southeast (around 77 percent), The North and Northeast together make up 16 percent of the sample, however the North alone accounts for only around 1.5 percent of the sample.[6]

In terms of industry, almost half the firms (46 percent) belong to the Garment and Furniture sectors; over a fifth (21.7 percent) belong to the Machinery and Shoe and Leather sectors, taken together. In terms of ownership, the vast majority of firms (94 percent) are private domestic firms. Private foreign ownership and government ownership represent 5.3 percent and 0.4 percent of the sample respectively. Only seven firms are state-owned,

5. Our threshold is two years as the majority of Brazilian firms that leave the market do so within the first two years (BNDES, 2003)

6. The Southeast, South, and Center-West are the richest regions, with per capita incomes of R$ 9,316, R$ 9,387, and R$ 7,260, respectively. The Northeast and North are the poorest regions, with incomes of R$ 3,255 and R$ 4,312 per capita, respectively. With regard to branch density, the Southeast has the largest number of branches (9263), whereas the South and Center-West have 3446 and 1283 branches, respectively. The Northeast, the poorest region, has 2383 branches and North has only 623 branches. (Appendix Table A.1)

Table 1. The Dataset: Characteristics of Sample Firms

Region	No. firms (%)	Industry	No. firms (%)	Ownership	No. firms (%)	Manager's education	No. firms (%)	Sales growth	No. firms (%)
North	24 (1.5)	Food Processing	127 (7.7)	Private Domestic	1549 (94.4)	Post Graduate	331 (20.2)	Increased	1042 (64.6)
Northeast	238 (14.5)	Textiles	106 (6.5)	Private Foreign	86 (5.2)	Graduate	500 (30.5)	Decreased	390 (24.2)
Center-West	121 (7.4)	Garments	442 (26.9)	State	7 (0.4)	Incomplete University	249 (15.2)	Unchanged	182 (11.3)
Southeast	713 (43.4)	Shoes & Leather	173 (10.5)			Vocational Training	185 (11.3)		
South	546 (33.2)	Chemicals	84 (5.1)			Secondary School	158 (9.6)		
		Machinery	183 (11.2)			Incomplete Sec. School	62 (3.8)		
		Electronics	79 (4.8)			Primary School	95 (5.8)		
		Auto-parts	130 (7.9)			Incomplete Primary School	60 (3.7)		
		Furniture	315 (19.2)						

Source: World Bank, Investment Climate Survey—Brazil, 2003.

of which six belong to the chemicals industry and one belongs to the electronics industry. State owned firms are large; three have more than 500 employees, six out of seven have annual sales of more than R$60 million per year. By contrast only 3.6 percent of private domestic firms have more than 500 employees and only 8.5 percent have sales of over R$60 million per year. Foreign-owned firms account for 5 percent of the sample, and around half are in the Machinery and Auto-parts industries. Foreign private firms are larger than domestic private firms; a fifth have more than 500 employees, and over a third have sales exceeding R$60 million.

Managers of about half the firms have completed university education. Yet, in 10 percent of firms, the manager's education does not exceed primary school. In more technologically intensive sectors such as Chemicals and Electronics, 80 percent of the managers hold a post graduate degree.

Measures of Firm Size

Alternative criteria for classifying firm size were tested. The most widely used criterion in Brazil is the number of employees, as defined by the Ministry of Industrial Development and External Trade.[7] This classification has also been adopted by the Brazilian Institute of Geography and Statistics (IBGE) and the Institute for the Support of Micro and Small Firm (SEBRAE).[8]

An alternative classification, based on sales volume, is used by Brazil's development Bank (the BNDES).[9] In addition, classification of firms by size deciles and quintiles was also investigated. For the most part, the study uses only the first definition, since there appears to be a high degree of co-movement of findings using alternative definitions. Using both the sales criterion and the number of employees, micro and small firms represent the largest share of the sample; around 70 percent taken together (Table 2). Micro firms form the largest share of the sample according to the sales criterion (46 percent of firms, with annual sales of around R$1.2 million); small firms represent the largest share on the employment criterion (52 percent, employing between 20 and 99 workers). A breakdown of the sample by firm size and by select firm characteristics is presented in Appendix Table A.2.

Construction of Other Variables

To test the hypotheses described above regarding firms' access to credit, the variables described above were constructed as follows: Firms' performance is proxied by a series of

7. Ministério do Desenvolvimento Indústria e Comércio Exterior. Note that this classification leads to an uneven distribution of firms in each sample category; a higher threshold for micro firms or a lower threshold for large firms could have corrected this. However apart from its widespread use within Brazil, this definition also coincidentally corresponds to that used by the Bank in all other ICA data analysis.

8. *Instituto Brasileiro de Geografia e Estatística* and *Serviço Brasileiro de Apoio às Micro e Pequenas Empresas*.

9. Banco Nacional de Desenvolvimento Econômico e Social., or National Bank for Economic and Social Development. *SEBRAE* uses a different definition for size according to sales. It follows the definition of Law 9841 of 10/5/99, in which a firm is classified as micro if its sales are lower than R$244,000; small if its sales are equal or greater than R$244,000 and lower than R$1,200,000; and medium or large if its sales are equal or greater than R$1,200,000.

Table 2. The Dataset: Alternative Classifications of Firm Size

	Number of employees (Nos.)	Number of firms	%	Sales (R$ 000 per year)	Number of firms	%
Micro	0 to 19	330	20	<1,200	736	46
Small	20 to 99	861	52	≥1,200 & <10,500	468	30
Medium	100 to 499	376	23	≥10,500 & <60,000	268	17
Large	More than 500	75	5	≥60,000	170	7
	500–999	53				
	1000–1999	12				
	2000–4999	7				
	>5000	3				
Total		**1642**	**100**		**1642**	**100**

Source: World Bank, Investment Climate Survey—Brazil, 2003.

variables including sales growth, turnover (sales to asset ratio), and leverage. For regional effects, five standard national regions are introduced as variables: North, Northeast, South, Southeast, and Center-West. Dummy variables for these are weighted by regional income per capita and by bank branch density. For industrial effects, nine industrial sectors are introduced, using the standard industrial (CNAE) classification, weighted by capital intensity, measured as the ratio of machinery and equipment costs to labor costs.[10] Managerial education is captured at eight levels.[11] Firm ownership is classified in three categories; state-owned, private domestic and private foreign. Bank ownership was classified similarly, for each firm based upon the main bank the firm used.

Additional control variables include whether the firm age is below five years, and whether or not the firm is an exporter (as measures of survival and competitiveness), firm status (incorporated or not); membership of a trade group or association, and use of external auditors, as measures of transparency. Finally, the proportions of the workforce with higher education (proxied by the percentage of workforce that use computers), and capacity utilization, were used as measures of innovation and capacity utilization.

The last group of variables, on bank relationships and creditworthiness, were measured by whether the firm has a unique bank relationship, whether the firm has collateral, whether the firm has an overdraft or line of credit, and finally, by the ownership of the main banking institution for each firm. A list of variables and their construction is given in Appendix Table A.3.

10. Textiles, Auto-Parts, Chemicals, Food Processing, Electronics, Machinery, Furniture, Leather & Shoes, and Garments.

11. Post graduate degree, university degree, incomplete university degree, vocational training after secondary school, complete secondary school, incomplete secondary school, complete primary school, and incomplete primary school.

Firm Size, Financing, Access to Credit, and Credit Constraints

Our analysis of access to financial services and firm size begins with a simple comparison of financing patterns across firms of different sizes. This is followed by a more specific question related to the role of size compared to performance and firm characteristics in explaining access to credit. Two models have been specified, to test the robustness of results obtained.

Firm Size and Financing Patterns

Based on data in the survey which provides a detailed breakdown of sources of funds (internal capital, banks, trade credit, leasing, credit cards, government funds, and informal sources), and separates these by uses (fixed and working capital, we use mean difference tests to investigate whether the sources of funds vary significantly across firm sizes.[12] Results are summarized in Table 3 later and detailed in Appendix Table A.4 and Appendix Table A.5 . In terms of importance, for all firm sizes, and for both working capital and for new investments, internal funds constitute the primary source of finance, especially for fixed capital (55 percent, compared to 45 percent for working capital).[13] Next in importance as a source of finance, for both working capital and new investments, is credit from the banking system, followed by trade credit, which for working capital contributes a substantial 14 to 16 percent of total financing. Informal sources can be important for working capital finance. Leasing, credit card finance, and equity play a minor role as financing sources.[14]

Looking at financing patterns across firms of different size, the findings which stand out are first, that differentials by size may be more pronounced for fixed capital than for working capital. In terms of the overall separation between external and internal funds, large firms use significantly more external funds to finance new investments (59 percent compared to 41–46 percent for other size categories). For working capital, differences are low (44.2 compared to 41.2 percent, and there is no steady progression across size categories). Trade credit too does not appear to vary systematically by firm size for working capital, however its is surprisingly also important as a source of finance for new investments, and here its importance does vary across firm size, representing around 12 percent for micro firms and between 7 and 9 percent for other firm sizes.[15] For bank finance and for funding

12. F-tests and Chi-Squared-Tests. Note that these can only test for differences from the mean and not for individual pairs of categories. Thus for example we cannot test whether the north is significantly different from the south, or whether the southeast is significantly different from the north. We test for significant differences in the use of internal funds across regions.

13. The results are corroborated by previous findings for Brazil. Brazilian firms primarily rely on internal finance, secondly, on debt finance and thirdly, on equity (Junior and Melo, 1999), confirming the Pecking Order theory. Equity finance represents a more important source of financing for larger firms than for other firms reflecting the equity gap.

14. Credit card use for financing working capital varies significantly (at 5%) across firm size when firms are classified according to sales only. Equity as source of financing for new investment varies significantly across firm size, being more important for medium and large firms, when size is defined according to sales and deciles and quintiles of sales.

15. Internal funds, local bank finance and trade credit represent around 80% of the total of the sources of financing for all firm sizes.

Table 3. Firm Size and Sources of Finance: Working Capital and New Investments

	Working capital				New investments			
No. of employees	Micro 0–19	Small 20–99	Medium 100–499	Large >500	Micro 0–19	Small 20–99	Medium 100–499	Large >500
Internal funds	44.2	43.3	44.8	41.2	58.7†	57.8†	54.0†	41.0†
Bank finance[1]								
Foreign	0.8§	0.9§	1.7§	4.9§	0.0§	0.8§	2.6§	3.2§
Local private	10.8	12.7	12.6	8.5	5.7	6.9	5.4	1.4
Local public[2]	11.9*	15.2*	17.6*	25.2*	10.4§	14.1§	19.1§	34.5§
Of which government funds	0.8§	1.9§	2.9§	6.0§	4.5§	6.5§	12.5§	25.3§
Trade credit	14.2	16.3	13.7	14.2	11.9*	8.6*	6.6*	9.2*
Leasing	0.5	0.9	0.8	0.3	2.2	3.1	3.5	5.0
Informal sources	10.5§	5.5§	1.8§	0.2§	4.4§	2.4§	0.4§	0.0§
Equity finance	2.7	2.7	4.7	1.8	3.5	3.8	6.0	4.0
Credit card finance	0.8	1.0	0.3	0.0	0.5	0.2	0.2	0.0
Others	3.6	1.5	2.0	3.7	2.7	2.3	2.2	1.7
Total (%)	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Total no. of firms	**328**	**860**	**373**	**72**	**247**	**716**	**324**	**64**

1. This disaggregation does not derive directly from the questionnaire. Local commercial bank finance is disaggregated into local private and local public finance according to the main bank the firm does business with.
2. Government funds are included in the local public bank finance category.

Statistical significance: * significant at 10%, † significant at 5%, and § significant at 1%.

Source: Based on World Bank, Investment Climate Survey data—Brazil, 2003.

from informal sources, there are significant differences across size categories for both fixed and working capital. Informal sources are very important for working capital finance for micro firms, representing 10.5 percent of working capital financing needs for micro firms, compared to only 0.2 percent for large firms.[16]

Second, a larger percentage of firms among medium and large firms have overdrafts or line of credit (81 and 83 percent respectively), compared to micro and small firms (60 and 76 percent respectively). As firm size increases the amount available through an overdraft or credit line as a percentage of sales increases sharply (from 33 percent for micro firms to 546 percent for large firms). Moreover, micro and small firms are charged higher interest rates on their overdrafts (around 5 percent) compared to medium and large firms (3 and 4 percent respectively). Sample data suggests that as size increases, the number of banks firms do business with also increases (Appendix Table A.6).

16. This also suggests that our later analysis of the impact of size on financing patterns could have been enhanced if the use of specific credits requested or received was known. Unfortunately, information on this has not been provided.

Third, separating banks by ownership, it emerges that public banks are more significant providers of capital for larger firms.[17] Micro firms use public banks for only 12 percent of their working capital needs and 10 percent of new investment finance, in contrast to 25 and 34 percent for large firms. Private commercial banks by contrast appear to supply micro, small and medium firms with a larger proportion of their needs than large firms, especially working capital needs (11–13 percent, compared to 8.5 percent for large firms). Private commercial banks account for a negligible proportion of large firms' working capital needs (only 1.4 percent, compared to 5.4–6.9 percent for micro to medium firms). Foreign commercial banks like public banks are far more important for large firms, and even provide for a significant part of their working capital needs (5 percent), in addition to the finance of fixed capital (3.2 percent).[18]

Sources of financing appear also to be affected by the other explanatory variables; region, manager's education, industry and sales growth. Better off regions use a higher proportion of external funds than poorer regions. Thus, the South uses less internal funds and more commercial bank finance, for both working capital and fixed investments, compared to other regions, while the North uses twice as much internal finance as other regions. In terms of the number of bank relationships, as size increases, the number of banks clearly increases (Appendix Table A.7). In terms of region and education, firms in the South work with a larger number of banks on average than firms from other regions. An examination of managerial education suggests that firms where managers holds post-graduate degrees use more finance from foreign banks and equity finance compared to other firms. More educated managers also work with a larger number of banks (Appendix Table A.8).

Access to Credit and Credit Constraints—Sample Frequencies

Moving from overall patterns of financing, to access to credit specifically, the next part of the analysis examines the relation between constraints in access to credit and firm size, performance, and other factors. Firms with access to credit are defined as those that express a demand for credit, apply for a bank loan and receive it.[19] Constrained firms are those that express a demand for a bank loan but either (i) apply for a bank loan and are rejected, or (ii) do not apply.[20] The data shows that 59 percent of large firms have loans, compared to 27 percent of micro firms. About 54 percent of large firms that did not apply for credit reported that they did not need a loan, compared to 39 percent of micro firms. About 61 percent of micro firms that did not apply for a bank loan reported other reasons

17. Local commercial banks were not separated into private and public banks in the data on financing sources. However the public bank share has been constructed by inference, using the name of the principal bank provided by each respondent.

18. These results are similar to those in Kumar (2004) which reports that for individuals, private banks were more active for small depositors and small loan segments than public banks.

19. This is access to credit in a narrow sense. In a wider definition, firms that do not have a loan but also have no demand (either because there is no need or because they can finance their needs in other ways) can also be defined as having access to credit.

20. Reasons cited in the questionnaire for not applying despite expressed demand include factors related to the environment such as complicated application procedures, corruption in the allocation of bank credit, or expectation of rejection, as well as cost related factors such as high interest rates or strict collateral requirements.