

Access to Financing for Small and Medium Enterprises

IN Latin America and around the world, small and medium enterprises (SMEs) comprise a large share of firms, employment, and gross domestic product (GDP). A new World Bank database on SMEs (defined as firms employing up to 250 workers) suggests that they employ nearly 50 percent of the labor force in the formal economy in Mexico; nearly 60 percent in Ecuador and Brazil; around 70 percent in Argentina, Colombia, Panama, and Peru; and as much as 86 percent in Chile (Ayyagari, Beck, and Demirgüç-Kunt 2003). Developed countries have a similar pattern: SMEs represent about 60 percent of total employment in Germany and the United Kingdom, about 70 percent in France and Japan, and about 80 percent in Italy and Spain.

SME entrepreneurs identify lack of access to credit as the most important obstacle to the development of their businesses. This fact, combined with the sheer size of the SME sector around the world, explains why most countries (developed and developing) have specific programs to address SME problems and why international financial institutions devote considerable resources to address the issue of SME financing.

That SMEs comprise an important share of GDP and that they lack access to credit, however, do not necessarily justify the need for the policy remedies targeted to this group. In fact, Hallberg (2000) suggests that social and political considerations that do not have a sound economic rationale are behind many of the programs targeted at SMEs. This chapter examines the economic case for programs to facilitate access to credit for SMEs and the forms those programs should take. Before tackling these issues, the chapter explores some important questions. Do SMEs have inadequate access to credit? How do countries in Latin America compare with other developed and developing countries in this regard? If access to credit is restricted for SMEs, why is this the case?

STYLIZED FACTS

One of the main problems in assessing access to credit for SMEs is the lack of reliable data, for example, on the share of bank credit to SMEs. In most countries, the data simply do not exist. Even in countries where credit data are available from credit registries, in most cases they do not include information about the size of firms. Any guesses regarding the share of credit to SMEs have to rely on proxies, such as the size of loans. The problem is compounded for cross-country comparisons because the definition of an SME varies from country to country.¹

This section uses data from the World Business Environment Survey (WBES) to assess whether SMEs face constraints in terms of their access to credit. The WBES provides data from more than 10,000 firms in 81 countries in 1999–2000. More than 2,000 firms in the survey are from 20 Latin American countries, and 80 percent are classified as small (up to 50 employees) and medium (between 50 and 500 employees). Although a lower threshold would better reflect the realities of SMEs in the region, the survey does not provide the exact number of employees, so it is not possible to tailor the definitions of the size groups. The analysis in this chapter treats small and medium firms separately. The main purpose of the survey is to understand the constraints that hinder the development of private businesses. Among the constraints considered, the WBES has a number of questions on financing constraints. Thus, the WBES offers comparable data across countries, which can shed some light on the issue of access to credit for SMEs.

¹ The official threshold for SMEs around the world is between 100 and 500 employees (Ayyagari, Beck, and Demirgüç-Kunt 2003).

Financing Constraints: A Major Obstacle to Development

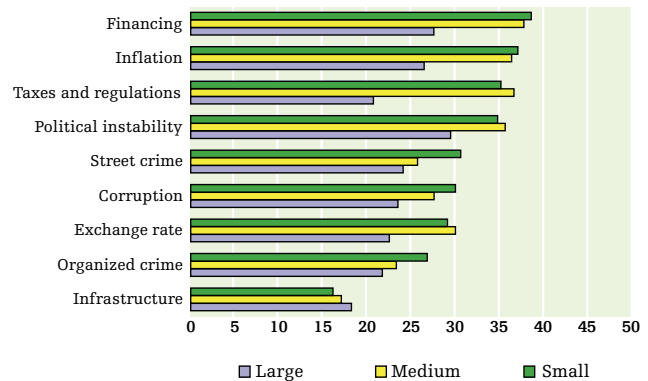
The WBES asks respondents to rate 10 general constraints on a scale from 1 to 4, with 4 indicating a “major obstacle” to the development of their business. Figures 14.1 and 14.2 report the share of firms (by size) that considered each general constraint to be major, for the world and for Latin America. Worldwide, financing constraints are the most serious obstacle, followed by inflation, taxes and regulations, and political instability. Around 38 percent of the SMEs surveyed (compared with 27 percent of large firms) reported that financing constraints are major. In Latin America, the corresponding figures are 46 and 41 percent for small and medium firms, respectively, compared with 26 percent for large firms. Other constraints, such as corruption and inadequate infrastructure, play a comparatively smaller role for SMEs.²

Financing Constraints for Small and Medium Enterprises

Are financing constraints more severe in the case of SMEs? Table 14.1 presents a number of measures of financing constraints, corresponding to small, medium, and large firms. The table reports the mean financing constraint (on a scale of 1 to 4) and the share of firms that rate financing constraints as a major obstacle. The results are similar for small and medium firms, but constraints are clearly lower in the case of large firms.

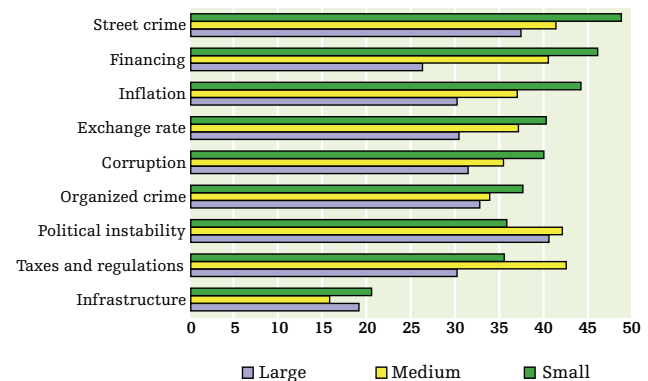
In addition to the responses based on subjective perceptions, the WBES asked other questions, based on more objective data, that can help shed light on this issue. In particular, the survey asked firms to report the share of total financing that comes from the following sources: retained earnings, equity, local commercial banks, development banks, foreign banks, family, money lender, supplier credit, leasing, public sector, or other sources. Table 14.1 reports the share of bank credit (including that from local commercial as well as foreign banks) in total financing as an alternative measure of financing constraints. The table also reports the share of firms that have some access to bank credit. According to these measures, SMEs have less access to bank credit than large firms do, and there are differences between small and medium firms.

FIGURE 14.1 Firms Reporting Major Obstacles to Development Worldwide, 1999-2000 (Percent)



Source: World Bank (2000).

FIGURE 14.2 Firms Reporting Major Obstacles to Development in Latin America and the Caribbean, 1999-2000 (Percent)



Source: World Bank (2000).

Accounting for Other Country and Firm Characteristics

There seems to be an association between firm size and the severity of financing constraints, but the link between size and financing constraints could be due to other factors, such as the age of the firm. Just as consumers without a credit record have trouble obtaining consumer credit, firms without a track record should

² The WBES also asks about a number of specific aspects of financing constraints. In Latin America, as well as around the world, the main financing issues firms complain about are high interest rates, lack of access to long-term loans, inadequate collateral, and excessive paperwork.

TABLE 14.1 SEVERITY OF CONSTRAINTS BY FIRM SIZE

Indicator	Firm size		
	Small	Medium	Large
Mean financing constraint (scale, 1–4)	2.87	2.85	2.58
Firms that rate financial constraints as a major obstacle (percent)	38.68	37.83	27.62
Financing from local or foreign commercial banks (percent)	10.77	17.16	23.96
Firms with access to bank credit (percent)	28.83	42.79	54.52

Source: IDB calculations based on World Bank (2000).

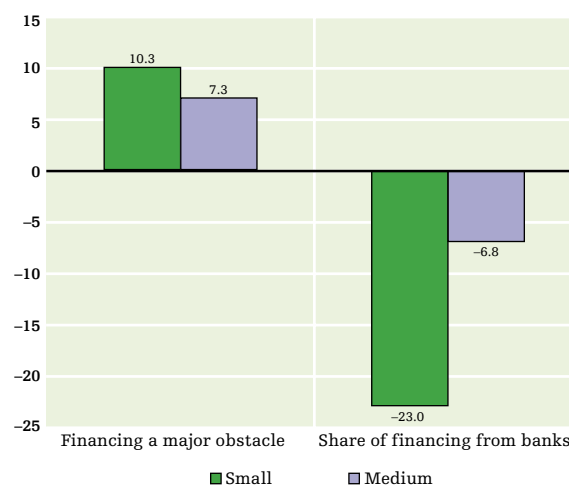
have trouble obtaining loans. Given the close association between size and age (the correlation is 0.31), the link between size and financing constraints could be due to experience rather than to size. Similarly, other firm characteristics (sector of activity, foreign ownership, and export activity) may affect financing constraints.

Appendix Table 14.2 reports the results of an analysis of the determinants of financing constraints, controlling for these and other firm characteristics. The regressions include country dummies in order to account for country characteristics that may affect financing constraints. The analysis uses two dependent variables: one based on the firm's perceptions (dummy = 1 if financing constraints are a major obstacle) and the other based on the sources of financing (the share of financing from local and foreign banks).³ Figure 14.3 summarizes the main results.

Regardless of the variable used, the results suggest that the severity of the constraints decreases with firm size. The likelihood that a firm reports a major financing constraint increases by 10.3 percent in the case of small firms and by 7.3 percent in the case of medium firms, compared with large firms. Likewise, the share of financing from banks is reduced by 23.0 percent for small firms and by 6.8 percent for medium firms, compared with large firms. With the exception of the small and medium firms in the case of the variable based on perceptions, the differences are statistically significant.

Small and Medium Enterprises in Latin America and the Caribbean

Figure 14.4 shows the share of firms that report major financing constraints broken down by region and size. Small firms in Latin America and the Caribbean are among the most financially constrained in the world, according to the perception of their executives. For small firms, only South Asia reports greater constraints. By contrast, large firms in Latin America re-

FIGURE 14.3 Firm Size and Financing Constraints for Small and Medium Firms Relative to Large Firms, 1999–2000 (Percent)

Source: World Bank (2000).

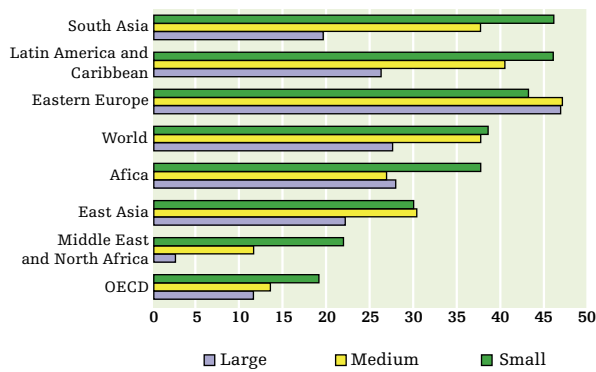
port smaller constraints than their counterparts in the rest of the world, although this result is driven mostly by European economies in transition, which comprise nearly one-third of the survey and in which constraints among large firms appear surprisingly high.

In stark contrast, small firms in Latin America exhibit comparatively high levels of access to bank financing, which are close to those for Organisation for Economic Co-operation and Development (OECD) firms (Figure 14.5).⁴ However, the similarities disappear in

³ In the case of the financing constraints variable based on firms' perceptions, the analysis also controls for what Love and Mylenko (2003) call the "pessimism" of the survey respondent, that is, the tendency of some respondents to complain about everything.

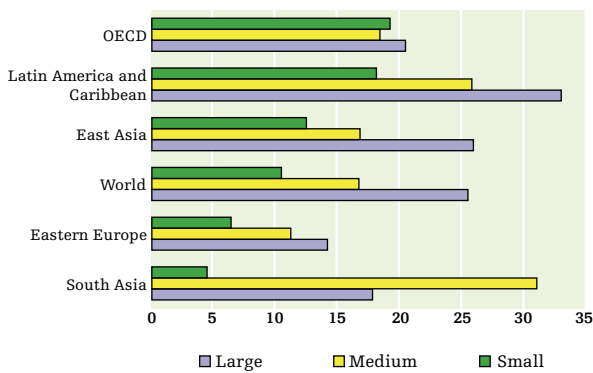
⁴ The picture is similar for the share of firms that have some access to bank financing, instead of focusing on the share of financing from banks.

FIGURE 14.4 Firms Reporting Financing as a Major Obstacle, 1999-2000 (Percent)



Source: World Bank (2000).

FIGURE 14.5 Bank Financing in Total Firm Financing, 1999-2000 (Percent)



Source: World Bank (2000).

the broader picture of the structure of financing in the two regions: while small firms in OECD countries rely on other formal sources of financing (such as leasing arrangements or equity financing), small firms in Latin America rely more heavily on informal sources (such as family and informal money lenders). In fact, informal sources of credit are three times greater in the case of small Latin American firms compared with their counterparts in the OECD.

In any case, the fact remains that although small firms in Latin America perceive that financing constraints are substantial, they seem to have better access to bank credit than their counterparts in other regions. This apparent contradiction may be due to the fact that the variable based on perceptions and the one based on financing structure actually capture somewhat different

aspects. At the same time, the results in Figure 14.5 are quite surprising; they highlight the need to control for other potential determinants of access to bank finance.

Appendix Table 14.2 presents a set of regressions that control for other firm and country characteristics that may help explain financing constraints. In addition to the variables used in the previous exercise, these regressions include interactions of the size dummies with Latin America and the OECD. The idea is to check whether small firms in Latin America, compared with their large counterparts, have particularly large financing constraints or whether the gap is more or less similar to the gap between small and large firms in other parts of the world. The signs of the coefficients for the interaction terms (positive in the case of the perception variable, negative in the case of the bank access variable) suggest that small firms in Latin America might be at a disadvantage compared with small firms in other regions. However, for the most part these differences are not statistically significant. Thus, any differences in Latin American firms are relevant across the board and not just for small and medium firms. The only exception is that, compared with the OECD, the gap in access to bank financing between large and small firms is significantly larger in the case of Latin America.

Country Experiences in Latin America

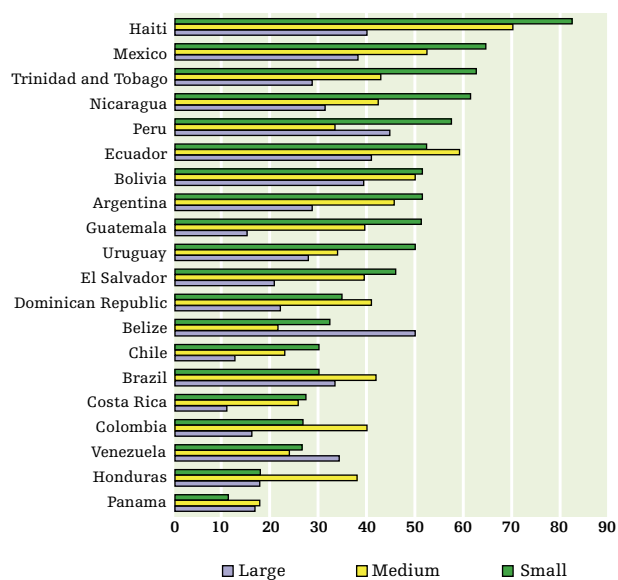
Are SMEs subject to similar financing constraints in all Latin American countries? Which countries suffer more in this regard? Figures 14.6 and 14.7 present the share of Latin American firms that report major financing constraints and the share of financing from banks, by country and firm size.

The figures show that access to financing varies depending on the country in which the firms are located. The contrast between Chile and Mexico provides a good illustration. Less than a third of the small firms in Chile report that they face major financing constraints, and these firms finance one-third of their investments with bank credit. By contrast, in Mexico, nearly two-thirds of the small firms face major financing constraints, while less than 5 percent of their financing resources are provided by banks.

REASONS FOR FINANCING CONSTRAINTS

There is ample evidence that SMEs face more adverse credit conditions than larger firms and that Latin Amer-

FIGURE 14.6 Firms Reporting Financing as a Major Obstacle, by Country, 1999-2000 (Percent)



Source: World Bank (2000).

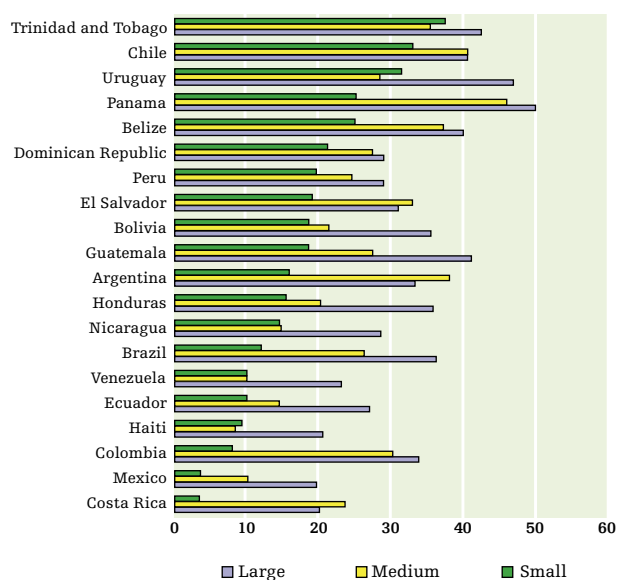
ica is no different in this regard. But is this enough to justify policy action? To answer this question, it is crucial to understand why size may matter in determining the availability and cost of credit for firms and to establish whether market failure is involved. In general, there are four main causes of credit problems for small firms: fixed lending costs, imperfect enforcement of credit contracts, bankruptcy costs, and asymmetric information.

Fixed Lending Costs

Providing loans is an activity that entails important fixed costs associated with loan appraisal, supervision, and collection. This implies that the cost per dollar lent is high for small loans. As a consequence, banks would have to charge higher interest rates on such loans to generate the required returns.

There has been much progress in this area in the past few decades, particularly in lending to micro enterprises, which would naturally experience this problem more acutely. Indeed, in what has been described as a “revolution in microfinance,” a new banking technology has been introduced that differs from the traditional technology. Instead of the formal paperwork and guarantees associated with regular bank loans, small, short-term loans are offered at high interest rates based

FIGURE 14.7 Bank Financing in Total Firm Financing, by Country, 1999-2000 (Percent)



Source: World Bank (2000).

on information gathered by bank agents (with proper incentives) who visit the firms and gather information from people who know the potential borrowers. This banking technology has proven very effective.

This micro-lending technology is not likely to be a solution for SMEs, which typically require loans that are too large to be handled in this way. In general, banks are unwilling to provide unsecured loans in excess of the small amounts usually lent to microenterprises. The policies to deal with this problem revolve around the reduction of these fixed lending costs and in some cases can be tied to the development of new technologies. A good example is credit scoring, in which banks use statistical methods and available information to cheaply and rapidly determine the probability that various credit applicants will fulfill their obligations. Development of credit registries would also help by reducing the cost to banks of acquiring the necessary information to make loan decisions. Subsidizing the development of risk assessors specializing in SMEs may be another policy worth considering.

Imperfect Enforcement and Bankruptcy Costs

Imperfect enforcement and bankruptcy costs are both problems that are inherent to credit contracts. More-

over, they tend to have particularly serious effects on small firms. Imagine that a firm refuses to pay a loan. The bank files for bankruptcy so that it can execute the guarantee. If the judicial system functions perfectly, this would happen immediately, with certainty, and at zero cost. But clearly this is not the case, even in countries with developed financial and judicial systems. There is always the probability that a borrower that defaults will get to keep part of the assets guaranteeing the loan. Thus, because of the problem of *imperfect enforcement*, the borrower may have something to gain by defaulting. This introduces incentive problems that are inherent to credit contracts.

Even if contracts were perfectly enforced, in the sense that borrowers would have to surrender the assets with certainty, the bank would incur time delays and real costs associated with executing the guarantee. Even if the bank were successful, it would generally attach a lower value to the guarantee than the borrower would. It is thus likely that there would be significant *bankruptcy costs* that would affect credit contracts because banks would try to minimize the probability of bankruptcy. This subsection explores the implications for small firms of these two realistic features of the environment in which credit takes place.

Imperfect Enforcement

Imperfect enforcement allows the debtor to capture part of the assets invested in the project by defaulting. In deciding whether to default, the debtor compares the expected payoff from defaulting with the value of continuing to operate the project while servicing the debt. With the size of the project kept fixed, the value of continuing the project increases with the firm's equity (and thus decreases with the firm's leverage) because the entrepreneur will get to retain a larger share of the project's returns. Thus, with low equity, running a firm at its optimal scale implies a high leverage ratio, which leads to strong incentives to default. In other words, as leverage increases, the default option becomes relatively more attractive. Credit constraints arise as a way to limit the firm's leverage and thereby align the entrepreneur's incentives with those of the bank. As a result, entrepreneurs with low equity will be credit constrained and will not be able to operate their projects at the socially optimal size. This is in fact the nature of the imperfect enforcement market failure. Thus, in the context of this model, firms with low equity are small precisely because they are credit constrained. Entrepreneurs with high equity will not be so constrained, and their firms will achieve the optimal size.⁵

What policy implications arise from imperfect enforcement? Not surprisingly, improving enforcement of credit contracts is the first-best policy recommendation that emerges from this analysis. In particular, strengthening creditor rights would lower the gains of borrowers from defaulting and hence ease the incentive problems that lead to credit constraints for small firms. This policy is generally recommended as a way to improve the financial system more broadly; it should be particularly effective in improving access to credit for small firms, which in the context of this model are the only ones subject to constraints.

However, even countries with well-developed financial and judicial systems do not exhibit perfect enforcement. There are three main lines of action for dealing with the consequences of this problem. First, improving the opportunities for using personal assets as collateral—by strengthening property registries or introducing reforms that allow the use of movable assets such as inventories, vehicles, or machinery as collateral—may increase the equity that entrepreneurs can bring to the project, thus mitigating the problem of imperfect contract enforcement. Second, developing credit registries that disseminate credit information among lenders would reduce incentives to default by making the punishment more severe. Third, subsidizing the cost of funds to banks would act as a welfare-improving, second-best intervention by increasing the present value of keeping the project going relative to the gains from default, thus allowing credit-constrained firms to grow toward their optimal size.

This last policy implication certainly requires a few caveats. First, the subsidy would also lead to inefficient expansion of firms that are already at the optimal size. However, in the case of a small subsidy, the losses should be second-order. These second-order losses could be avoided by targeting the subsidy to loans for small firms, provided the agency costs of ensuring that the funds go to the target group are not excessive. Second, the efficiency gains generated by the subsidy would have to be compared with the first-order losses associated with the distortionary taxation required to raise the funds to finance it. Third, the model assumes that the banking sector is competitive; otherwise, banks could appropriate the subsidy and prevent the growth of credit-constrained firms.⁶

⁵ For a more formal treatment of this issue, see Rodríguez-Clare and Stein (2004).

⁶ Actually, a constant mark-up would be a sufficient assumption.

BOX 14.1 | FORMALIZING PROPERTY RIGHTS IN PERU

De Soto (2000) defines *dead capital* as all the assets that are not formally registered and thus cannot be used as collateral for a loan. His Institute for Liberty and Democracy (ILD) reports that, in 1987, dead capital represented around US\$70 billion in Peru. In 1988 the country enacted a Property Registry Law with the main goal of integrating extralegal property into the legal system. According to De Soto, this law had the effect of saving 99 percent of the administrative cost and reducing the time to record a property from more than 12 years to a month.

In order to ensure that extralegal property was titled and recorded, a new organization was launched, the Registro Predial, which was first managed by ILD and then transferred to the government along with the new Commission for the Formalization of Informal Property (COFOPRI). Since 1996, COFOPRI has unified all the information and databases on property titles and blueprints for nearly 1.5 million titles. In the past few years, COFOPRI has applied new software and digital systems to develop a secure, fast, and low-cost property rights formalization process.

Other less interventionist policies could act on the same principle of the subsidy. In particular, policies that strengthen competition in the banking sector would lead to a reduction in lending rates and contribute to an efficiency-enhancing expansion of credit-constrained firms. An expansion of government borrowing, if it leads to higher interest rates on loans, would have the opposite effect.

In the static setting of the imperfect enforcement model discussed above, firms differ in size only because of their initial level of equity. In a dynamic setting, however, the rate of return on equity would be larger for firms that are credit constrained. These firms would grow faster than others and would eventually achieve the optimal size (Albuquerque and Hopenhaym 2002). Thus, differences in start-up equity are not likely to lead to persistent differences in size. In the context of this model, it would be difficult to claim that mature firms are small because of credit constraints. More likely, differences in size among older firms are explained by other factors, such as the kind of good produced and the inherent productivity of the entrepreneur or firm. This reasoning implies that, to the extent possible, government policy dealing with lack of credit among small firms should focus mainly on younger firms.⁷

Bankruptcy Costs

Imperfect enforcement of credit contracts implies that banks want to limit a firm's leverage in order to improve its incentives and increase the likelihood of repayment. Thus, credit constraints are imposed directly by the bank. In the case of bankruptcy costs, the firm does not

default because of the incentives the borrower might have to run away with the firm's assets, but because a negative shock affects the borrower's ability to repay. Thus, instead of bank-imposed credit limits, bankruptcy costs lead to interest rates that rise steeply with the firm's leverage. In turn, this leads firms to voluntarily limit the amount of debt they undertake, even to the point of running projects or firms that are inefficiently small. For the sake of simplicity, this section refers to both bank-imposed and firm-chosen limits to leverage ratios (that lead to smaller-than-optimal firm size) as credit constraints.

Even without bankruptcy costs, it is reasonable to expect banks to charge a higher interest rate to firms with more leverage because, other things equal, banks will recover a smaller share of loans to such firms in the event of bankruptcy. However, by itself this phenom-

⁷ Going one step further, this argument points to the problem of potentially high-productivity firms that are not created because of lack of start-up equity. This problem may be as severe as the problem of lack of credit for small firms. Imagine that there are excellent and good ideas, and entrepreneurs with low and high wealth. Under perfect capital markets, entrepreneur wealth would not be a constraint, and all excellent ideas would be exploited. But with imperfect capital markets, entrepreneur wealth matters, and it is likely that excellent ideas by low-wealth entrepreneurs will not be implemented. Bank finance may not be the optimal instrument for the capital needs of these projects, as it may entail excessive risk. This may explain why, for example, the Small Business Administration (SBA) in the United States has a program of equity injections in promising but risky new entrepreneurial ventures. Companies such as AOL, Intel, and Federal Express, among many others, were started with equity support from this SBA program.

enon would not generate credit constraints because a firm's return on equity increases with leverage, and it can be shown that the two effects exactly compensate each other. Thus, the firm would choose the optimal project size despite interest rates that rise with leverage. This is no longer the case, however, if there are costs associated with bankruptcy.

To see this, note that the probability of bankruptcy is likely to rise with a firm's leverage because even small negative shocks to returns would prevent a highly leveraged firm from servicing its debt. With real bankruptcy costs, a higher probability of bankruptcy must go together with higher interest rates to compensate the bank ex ante for the higher expected cost of bankruptcy. In this case, the financial cost for the firm of increasing its leverage is greater than the associated benefits, and the firm will want to limit its leverage to a level below that corresponding to the optimal project size. Thus, again, firms with low equity will be credit-constrained and small.⁸

Most of the policy implications discussed above for the case of imperfect enforcement apply as well in the case of bankruptcy costs. In this case, the strengthening of creditor rights would decrease the time delays, uncertainty, and legal costs associated with executing the loan's collateral. In addition, it would be desirable to implement policies to increase the liquidity of collateral (for example, to make the real estate market more liquid) in order to reduce the costs associated with the execution of collateralized assets.

Asymmetric Information

Similar results to the ones presented above arise in the better-known case of asymmetric information between banks and borrowers. Asymmetric information causes the problems of moral hazard and **adverse selection**.

Moral Hazard

Consider the standard problem of moral hazard in credit contracts, in which the manager's effort determines the likelihood of success of a project but is unobservable to the bank. The manager will exert effort up to the point where marginal cost equals marginal benefit, which is given by the marginal increase in the project's expected returns net of interest payments. As the leverage ratio of the firm increases, the marginal benefit of effort falls because more of the gains go to the bank and less remain in the firm. Thus, a higher leverage ratio reduces the incentives of the manager to devote effort to the project. Knowing this, the bank sets a limit to the

firm's leverage ratio. Again, low-wealth entrepreneurs run small firms that are credit-constrained.

What are the policy implications of this case? As above, it is desirable to improve the conditions for the use of assets as collateral because collateral improves the incentives of entrepreneurs to exert effort. Strengthening credit registries also helps by increasing punishment in case of failure, thus improving the incentives for managers. Similarly, a small subsidy would improve efficiency, although the same caveats discussed above apply here as well. Finally, it would be desirable to pursue policies that facilitate (although not necessarily subsidize) the use of reciprocal credit guarantee schemes in which loan decisions, monitoring, and discipline are shared with agents who are in a better position to observe effort or have leverage to induce it.

Adverse Selection

It is useful to start with a brief reminder of the main idea in the model of asymmetric information and credit rationing developed by Stiglitz and Weiss (1981). In this model, there is a known distribution of borrowers, all with the same expected returns but differing in the spread (risk) of those returns. Some borrowers are thus riskier than others. Given that borrowers earn zero net returns when the project does badly (because all income goes to pay for the loan) but get to keep all the excess returns when the project does well, borrowers act as if they were risk-loving. That is, other things equal, a more risky profile of gross returns (an increase in the spread of gross returns holding the mean constant) earns higher expected net returns for borrowers. Thus, as the interest rate charged by the bank increases, the pool of applicants gets riskier because the safer borrowers drop out of the applicant pool. This implies that, for a sufficiently high interest rate, further rate increases lower the bank's expected returns. In other words, expected returns as a function of interest rate r first increase and then decrease, with a maximum at some interest rate r^* , at which the marginal cost of **adverse selection** exactly compensates the direct benefit of increasing the interest rate. If the demand for loans by firms at this interest rate is greater than the supply of funds to the bank, then there will be credit rationing.

This result is not enough for the present purposes, however, because it only says that some firms will not receive as much credit as they want at the equilibrium interest rate; it does not say which firms will be affected.

⁸ A good treatment of credit constraints due to bankruptcy costs can be found in Bernanke and Gertler (1989).

In particular, the model does not indicate whether credit rationing affects SMEs more than large firms. Imagine, however, that banks have the option of acquiring information about the risk characteristics of applicants, but also that this information is costly. Assume further that this cost does not depend on the size of the firm. Then it can be shown that credit rationing will be more severe for small firms because the cost per dollar lent in this case is higher, so banks will choose to rely more on credit rationing to prevent the pool of applicants among this group from becoming dominated by high-risk types.

Similarly, it is natural to assume that the cost of acquiring information decreases with the age of the firm. In fact, it could even be argued that for new firms this signal is practically impossible to generate. In this case, credit rationing would be more severe among young firms relative to older ones.

How does collateral work in this setup? The use of collateral allows for a separating equilibrium in which banks have two instruments to affect the risk of applicants: interest rate and collateral. The bank could offer loans with a high interest rate and low collateral (which would be attractive to high-risk firms) as well as loans with a low interest rate and high collateral (which would be chosen by low-risk firms). Thus, firms would reveal their type (the term *separating equilibrium*) in choosing one bundle over the other.

As in the previous case, the policy implications that arise in this case include improving the way in which external assets can be used as collateral for loans. It would also be desirable to allow for the use of reciprocal credit guarantee schemes, thus placing the loan decisions in the hands of those that have better information about the risk characteristics of the borrower. More generally, policies should be geared toward reducing the cost of obtaining information for the bank, which could be done by establishing and applying uniform accounting standards, credit registries, and policies that allow banks to use credit-scoring technologies more intensively. Credit-scoring technologies are statistical methods that aggregate the information in a potential borrower's credit report to generate an inferred probability of default.

Another way to reduce the cost of obtaining information would be to encourage (perhaps through a system of grants) the development of expertise in assessing SME risk. Such expertise would be an important condition for the development of credit to SMEs and is in short supply in most countries. Grants may be justified because the development of such expertise involves an externality: a bank may invest in generating this capability, and trained experts may then be hired away.

Summary

There are a number of channels through which small firms may be subject to some form of credit constraints. The conceptual discussion, in particular the policy implications derived from it, is useful for several reasons. First, it suggests some potential country-level determinants of SME financing constraints (such as respect for creditor rights and availability of credit registries). Second, it provides the basis for a more detailed discussion of the policy options available to countries, as well as the experience of some countries in attempting to facilitate access to credit for SMEs.

DETERMINANTS OF FINANCING CONSTRAINTS: EMPIRICAL FINDINGS

Until recently, lack of comparable data hampered attempts to study the determinants of financing constraints for SMEs in a cross-country context. The recent availability of data from the WBES has led to a number of studies on the determinants of financing constraints. For the most part, these studies look at the impact on credit constraints of a single explanatory variable (such as foreign bank penetration, bank competition, availability of credit registries, or creditor rights) and do not attempt to bring all the potential determinants together into the analysis.

Clarke, Cull, and Martínez Pería (2001), for example, investigate the impact of foreign bank penetration on lending to SMEs. They find that foreign bank penetration increases the share of financing from banks and lowers financing obstacles as perceived by firms, particularly in the case of large firms. Love and Mylenko (2003) explore how credit-reporting institutions affect financing constraints. The authors find that private credit registries relax financing constraints and increase bank financing, particularly for SMEs. By contrast, public registries do not have a significant effect.⁹ Beck, Demirgüç-Kunt, and Maksimovik (2003) study the impact of bank concentration on firms' financing obstacles and access to credit.¹⁰ They find that in countries with

⁹ See Chapter 13 for a more general discussion of the role of credit registries in the financial system. For a more complete treatment of this topic, see Miller (2003a).

¹⁰ The impact of bank concentration is theoretically ambiguous because concentration may increase interest rates, but it may also provide incentives for banks to invest in collecting information on new clients.

low levels of institutional development, bank concentration leads to higher obstacles and a lower share of bank financing, particularly in the case of SMEs. Finally, Galindo and Micco (2004b) explore the impact of several measures of creditor rights protection on the share of financing from banks. They find that creditor rights increase access to financing by SMEs relative to the effects on large firms.

This section extends this literature by including in the analysis all the variables that various studies consider in a piecemeal approach, as well as some additional variables suggested by the conceptual discussion of the previous section. The first exercise looks at the determinants of financing constraints, irrespective of the size of the firm. In this case, the regressions include regional dummies, but not country dummies, because the focus is on explanatory variables that vary by country, but not by firm. The second exercise analyzes whether the explanatory variables have differential effects on SMEs compared with large firms. Thus, regressions include interactions between the explanatory variables and the size dummies, as well as country dummies in place of the regional dummies of the first exercise.¹¹ Appendix Tables 14.3 and 14.4 report the results of the regressions, which are summarized in Table 14.2. Appendix Table 14.1 provides descriptions and sources of the variables.

The following are the main results on the determinants of financing constraints:

- *Enforcement of credit contracts.* Effective enforcement of creditor rights reduces financing constraints as perceived by firms, and, in the case of small firms, increases access to bank financing.¹²

- *Credit registries.* Private credit registries have a positive impact on firms' access to bank finance, particularly in the case of small firms and appear to reduce perceived financing constraints, although the effect is not robust to the inclusion of other policy variables. Public registries have no specific impact on access to financing by small or medium firms, a result that is consistent with the findings by Love and Mylenko (2003).¹³

- *Crowding out.* High domestic government **debt** increases the severity of perceived financing constraints and reduces access to bank financing, particularly in the case of small firms.¹⁴

- *Bank concentration and bank ownership.* A concentrated banking sector increases financing constraints for small firms. There is some evidence that the importance of state-owned banks (relative to GDP) reduces perceived financing constraints in the case of small firms, controlling for the level of financial development of the economy as a whole. By contrast, foreign bank

penetration relative to GDP tends to reduce financing constraints overall but has no differential impact on small firms.¹⁵

- *GDP volatility.* Although it is not a policy variable per se, GDP volatility increases financing constraints in the case of small firms but has no discernible impact on the share of financing from banks.¹⁶

The evidence presented here suggests that policies and institutions can make a difference regarding access to credit for SMEs. However, it is important to use these results with caution because in addition to some limitations of the database, some of the results are not robust to changes in the specification. Clearly, much more research is needed on this topic in order to offer definitive answers about the key elements of strategy to encourage access to financing for SMEs. Taken together with the conceptual discussion in the previous section, however, the results presented in Appendix Table 14.4 provide a good starting point to begin thinking about policy action.

POLICY ISSUES

SMEs suffer from worse credit conditions than large firms. Market imperfections—such as imperfect contract enforcement and asymmetric information—can explain these findings. Several policies may be appropriate for dealing with these imperfections.

¹¹ Sector dummies were included in all the regressions as well. For the main results presented here, the regressions did not control for GDP per capita, a variable that is highly correlated with many of the institutional variables of interest.

¹² Results are weaker for regressions that use the creditor rights index alone and for those that control for GDP per capita.

¹³ Data on credit registries come from the World Bank's Doing Business database. The positive coefficient for public credit registries in Table 14.2 is surprising and may be a reflection of the endogeneity of these registries; countries may set them up in response to a generalized perception of severe credit constraints.

¹⁴ However, these results are not robust to the inclusion of GDP per capita.

¹⁵ Medium firms tend to complain relatively more about access to finance when foreign penetration is high.

¹⁶ GDP volatility can increase financing needs because in addition to working capital and investment, firms need financing to survive prolonged periods of negative shocks. At the same time, volatility increases risk, particularly in the case of small firms, and makes the value of the collateral more uncertain.

TABLE 14.2 | THE DETERMINANTS OF FINANCING CONSTRAINTS

Determinant	Effects across the board		Marginal effects on small and medium enterprises	
	Financing constraints	Bank finance	Financing constraints	Bank finance
Effective creditor rights	-			+(S)
Public credit registry	[+]	+		
Private credit registry	[-]	+		+(S)
Government debt	+	-		-(S)
GDP volatility			+(S)	
Bank concentration			+(S)	
Financial development * state-owned banks			-(S)	
Financial development * foreign-owned banks	[-]		+(M)	

Note: The values in the first two columns correspond to the results in Appendix Table 14.3. Square brackets around the signs indicate that the significance of the variable depends on whether it is included in the regression by itself, or together with the other policy variables. The first two columns explore the determinants of financing constraints and bank financing regardless of the size of the firms. The third and fourth columns focus on the specific impact on small and medium enterprises. The table reports the sign of the impact of each variable provided it is statistically significant.

Creditor Rights

Credit contracts fundamentally differ from spot transactions because credit contracts imply the exchange of money today for a promise to pay in the future. This type of transaction will develop fully only under a well-functioning legal framework. Lenders must rest assured that if the borrower refuses to pay, they will be able to turn to the legal system so that the guarantee can be executed and liquidated promptly and at low cost. The set of laws and institutions associated with this is commonly referred to as creditor rights. As discussed in Chapter 12, there is ample evidence that strong *creditor rights* are a key condition for the development of the financial system. Thus, although it may be surprising to the layman, one of the most effective ways to help potential borrowers is to strengthen the rights of creditors (see Kroszner 2003).

Creditor rights are particularly helpful in allowing small firms to access credit at reasonable cost. Small firms have low equity, which requires high leverage ratios in order to achieve an efficient scale of operation. Better creditor rights help align the incentives of borrowers with those of the lenders and thus allow these firms to increase their leverage ratios. In short, creditor rights are not only important for the development of the financial system; they are also particularly effective in improving access to credit under reasonable conditions for SMEs.

What are the most important policies that governments should undertake to strengthen creditor rights? Chapter 12 provides a detailed discussion of this point. An important element for protecting creditor rights entails the use of assets as collateral.

Collateral

Collateral is a key element of credit contracts. It decreases the incentives of borrowers to default, increases the incentives to devote effort to the project, and decreases bankruptcy costs for banks. The possibility of using outside assets as collateral allows firms to maintain higher leverage ratios, which is particularly important for small firms. Using collateral in this fashion, however, requires a sophisticated legal and economic structure.

In particular, there are three conditions for collateral to be useful in credit contracts: well-defined property rights, adequate creditor rights, and asset liquidity. Well-defined property rights are required so that borrowers can credibly establish ownership of the asset used as collateral. This requires the obvious laws establishing property rights, as well as well-functioning registries. No one has stressed this point more forcefully than De Soto (2000) (see Box 14.1). Creditor rights are required so that banks can execute the collateral if a borrower defaults on a loan. And, finally, asset liquidity is required so that banks can liquidate assets at low cost.

Invoice Discounting or Factoring

Many SMEs are suppliers to large firms. They may provide inputs or services to larger manufacturing firms or finished goods to large retail chains and supermarkets. In general, such transactions take place with deferred payment, usually from 60 to 90 days. This implies that, in effect, SMEs end up providing credit to larger firms.¹⁷ Given the difficulties that small firms have in securing access to credit, special mechanisms have developed to allow suppliers to obtain credit to finance their working capital requirements. These mechanisms are called *invoice discounting* or *factoring* and consist of financial agents that discount the invoice to the supplier. If the buyer does not pay the amount on the invoice, the financial agent that discounted it retains the right to go back to the supplier to collect on the loan.¹⁸

Given that SMEs have difficulties in accessing credit, it is important to find ways for them to use invoices to obtain credit on better terms. The past two decades have seen major improvements in this area in Latin America. In Brazil, Chile, Costa Rica, and Mexico, for example, invoice discounting is now a common practice. But other countries, such as Argentina, have yet to take the necessary steps for this system to develop (see Box 14.2).

Three conditions appear to be essential. First, laws must allow and protect the transfer of invoices from suppliers to financial agents. Second, laws must establish clear procedures that can be taken to enforce the buyer's payment of invoices. And, third, creditor rights of factoring agents vis-à-vis the supplier (who, in effect, is obtaining credit through this transaction) must be strengthened so that the supplier's implicit guarantee to repay the loan in the event that the invoice is not paid by the buyer can be executed quickly and at low cost.

Credit Information and Credit Scoring

One of the impediments to better access to credit for small firms is the possibility of adverse selection, which arises because banks do not possess adequate information about the risk characteristics of credit applicants. In simple models, this leads to credit rationing because banks refuse to increase the interest rate even when there is an excess demand for credit, as this would worsen the risk characteristics of their applicant pool. But banks can do more than this; they can invest resources to acquire information about the risk characteristics of applicants. The problem is that this entails costs that are not directly proportional to the size of the

firm or the loan requested because there are fixed costs involved. Thus, there would likely be more credit rationing among small firms than among large firms, for which banks would be willing to spend the necessary resources to acquire information and avoid using the interest rate as a screening device.

Thus, policies that reduce the costs of acquiring information about borrowers would alleviate the credit constraints faced by SMEs. One such policy is the promotion of credit registries, where banks can access information about the credit history of loan applicants. In addition to reducing the cost of collecting information, credit registries help to reduce the incentives of debtors to default on their loans. As with other policies, the details of design and implementation are crucial to guarantee that the system functions well. For an in-depth discussion of the policy issues involved, see Chapter 13.

In addition to encouraging the creation of private or public credit registries, governments could also encourage the use of credit-scoring technologies. These technologies, which in Latin America are used mostly for mortgage markets and consumer loans, have become prevalent in the United States for lending to SMEs. Indeed, it is customary for U.S. banks to widen their information about prospective borrowers by buying a credit score along with the credit report. Credit scoring lowers lenders' costs of processing credit information by allowing for specialization and associated economies of scale. As explained above, this should be particularly beneficial for SMEs.

Reciprocal Loan Guarantee Schemes

An interesting approach for dealing with the problems that arise from imperfect enforcement and asymmetric information entails bringing into the credit relation agents who have privileged information and/or leverage over borrowers. Consider, for example, the case of a group of suppliers and clients of a large manufacturing firm. The large firm could guarantee a loan to the supplier because the large firm has the leverage to impose an extra cost on the supplier in case of default. This could be particularly helpful when enforcement of credit contracts is weak. In addition, the large firm

¹⁷ Given that credit costs less for large firms than for SMEs, this is surprising; both parties could be better off by lowering the price of the exchange and turning it into a spot transaction. This puzzle requires more research.

¹⁸ In developed countries, there can also be nonrecourse discount of invoices, in which case the seller does not have responsibility once the invoice is discounted.

BOX 14.2 | FACTORING IN LATIN AMERICA AND THE WORLD

Factoring systems differ in a number of dimensions. In developed countries, either *recourse* or *nonrecourse* factoring is used. In the case of recourse factoring, if the buyer does not owe up to the invoice, the financial agent who discounted it retains the right to collect from the supplier. In the case of nonrecourse factoring, the seller does not have responsibility once the invoice is discounted. Recourse factoring is cheaper and usually carries less stringent requirements. However, it has an important disadvantage: when the client fails to pay on time, a small firm may suddenly find that it has to meet a payment it did not plan for. It is not infrequent for a small firm to end up with a bad credit rating and lose access to financing as a result of a client's nonperformance on a discounted invoice. In Latin America, all factoring is of the recourse variety.

The distinction between recourse and nonrecourse is probably not the most important one. In some countries, such as Brazil, the supplier has the right to discount any invoice, or *duplicata*, without further approval by the client. In addition, the law allows for the use of special courts to expedite the resolution of claims. Although factoring is of the recourse variety, the combination of the above factors (the obligatory nature of the system and the enhanced creditor rights component) makes for a

well-functioning system that serves the needs of small firms.

Other Latin American countries fall short in some of these dimensions. In Chile, for example, the system is not obligatory, so the client may deny the supplier permission to discount the invoice. The client would do this because when the invoice is discounted, the client has to deal with the bank, which can easily collect the payment, rather than the small supplier, which has less leverage and may be convinced to accept further delays, even when the supplier has the legal channels at its disposal for rapid collection. Despite this shortcoming, factoring in Chile works fairly well.

In Argentina, the law regulating the discounting of invoices has not been put into effect. In addition, although other forms of debt documents have access to special expedited court rulings, invoices do not. As a result, factoring in Argentina does not work, thus denying small and medium firms an important source of financing.

In Mexico, Nacional Financiera (NAFIN), a public, second-tier financial institution, has recently established an electronic discount system. It allows firms in certain clusters, with the blessing of their large clients, to automatically discount invoices through a number of first-tier banks at discounts that have been agreed on ahead of time.

would provide such a guarantee only to suppliers that have shown good management and reliable service and whom they know are good subjects of credit. In other words, the large firm would in effect bring its privileged information regarding the supplier to bear in the credit screening process.

Argentina has had some experience with reciprocal loan guarantee schemes, in which a number of large firms (*socios protectores*) contribute through these schemes to facilitate access to credit for their suppliers and clients (*socios partícipes*). According to the Camara de Sociedades y Fondos de Garantía Recíproca, nearly 4,000 SMEs have benefited from these schemes so far, receiving guarantees for a total of nearly 400 million dollars. In Argentina, the Law of Reciprocal Guarantee Schemes includes fiscal incentives in order to induce

the large firms to participate. In principle, however, these schemes could potentially be of interest to all parties involved, even without the need for fiscal incentives, provided they are adequately designed.

Other Loan Guarantee Schemes

Reciprocal loan guarantee schemes are a particular type of a larger class of schemes in which third parties provide a guarantee on the loans granted to SMEs. In the more common type of loan guarantee scheme, a public agency grants a partial guarantee on loans given by a group of banks to firms satisfying particular conditions (such as size, region, and industry). This type of guarantee can be seen as insurance on the loan obtained by the bank: the bank pays a fee to obtain the guaran-

tee, and the bank still bears part of the risk because the guarantee never covers the total loan.

Unlike reciprocal loan guarantee schemes, other loan guarantee schemes do not have superior information or leverage over the borrower. The question arises, then, as to whether nonreciprocal loan guarantee schemes can be justified on efficiency grounds. If banks are risk-neutral vis-à-vis a small loan (either because they are truly risk-neutral or because they can diversify away such small risks), loan guarantee schemes cannot be justified on the grounds that they reduce risk for banks. Thus, loan guarantee schemes would not induce banks to absorb the additional risk associated with lending to SMEs.

An argument for why loan guarantee schemes may enhance efficiency has to do with bank regulations that penalize banks for lending without appropriate collateral.¹⁹ As a consequence, banks demand guarantees not only to improve the incentives of borrowers to repay loans, but also to avoid such regulatory costs of lending without collateral. This may lead to credit constraints on firms that lack assets that can serve as collateral. The first-best response to this distortion would be to improve banking regulation so that capital requirements are appropriately determined by the risk of the bank's loan portfolio. If this is not possible, however, then a loan guarantee scheme may be an efficiency-enhancing second-best policy.²⁰

The design and effective administration of a loan guarantee scheme is a difficult task. Given that the bank no longer bears full risk for loan decisions, this naturally leads to moral hazard on the part of the bank, so a question arises as to how the loan guarantee scheme deals with this problem. One approach would have the scheme review every petition for a guarantee to make sure that the potential borrower is creditworthy. This would be inefficient because it implies that the credit review and risk assessment would be done twice. A more efficient alternative would be for the loan guarantee scheme to establish a system whereby the fee charged to banks for the guarantee would increase with the bank's default history. Alternatively, the scheme may establish that banks with a default ratio above a certain level would be ineligible to participate in the scheme.

Credit Subsidies and Onlending Programs

Higher leverage leads to lower incentives to repay or exert effort to improve the likelihood that the project will be successful. Roughly speaking, a high interest rate increases effective leverage by reducing the share

of profits retained by the entrepreneur. Thus, high interest rates worsen the distortions associated with imperfect enforcement, bankruptcy costs, and asymmetric information, leading to stronger credit constraints. This implies that high interest rates have particularly negative consequences for SMEs. This argument also explains the intuition for why a small subsidy to the cost of funds for banks could improve efficiency and access to credit for SMEs.

As usual, however, the problem with this policy conclusion is in the details. A small subsidy to the cost of funds for banks would not necessarily improve efficiency if banks do not behave competitively, as is likely to be the case in Latin America. Moreover, the management of a program of interest subsidies presents serious challenges of agency design that would have to be carefully considered. Perhaps this is why, instead of simple subsidies, governments usually implement onlending programs, such as the one by the National Economic and Social Development Bank (BNDES) in Brazil (Box 14.3). In these programs, a third party (usually a public development bank or an international financial institution) provides funds at below-market interest rates to finance bank lending to groups of firms restricted by size, age, location, or the gender of the entrepreneur. The common practice is that the interest rate that banks can charge on these loans can be no more than a few percentage points above the interest they pay for the funds. In a way, this type of policy works as an implicit subsidy but with strings attached, such that even with imperfect competition among banks, it would still be the case that banks pass the subsidy on to the intended firms.

Generating Expertise

Lending to SMEs is different from lending to large firms. In the case of young firms, it is more difficult to acquire information. Moreover, given the small size of the loans, it does not pay for the bank to undertake a detailed review of the creditworthiness of SMEs. Thus, for SME lending to be profitable, banks must experiment with new approaches and technologies for risk assessment and loan management. The problem is that

¹⁹ This arises because bank regulation imposes capital requirements that increase with the risk associated with the bank's portfolio. Given that the assessed portfolio risk increases with the share of loans that do not have proper guarantees, bank regulation imposes a cost to banks of lending without guarantees.

²⁰ Loan guarantee schemes may also boost bank lending to SMEs when the fees charged for the guarantees involve a subsidy.

BOX 14.3 | LOAN GUARANTEE FUNDS: THE CASE OF BRAZIL

Development banks are often the key players in financing for small and medium-size enterprises (SMEs). In Latin America, by far the largest development bank is the National Economic and Social Development Bank (BNDES) in Brazil. In 2003 alone, BNDES approved nearly 100,000 operations with SMEs and microenterprises, with total financing of more than US\$3.2 billion.

Although BNDES provides the funding, the risk of each loan is borne by accredited financial institutions. The total cost of a BNDES loan comprises four parts: the financial cost, which is set mainly by a long-term interest rate set by the National Monetary Council; a fee that BNDES charges; other charges; and the risk premium freely negotiated between the accredited institutions and the clients.¹

Despite the relatively low funding rates charged by BNDES, accredited agents often have resisted lending to SMEs, pointing to two main factors. First, SME risk has a large effect on the overall weighted risk associated with the calculation of capital requirements for regulation purposes. Second, pledgeable and/or liquid collateral has low value or is lacking. In order to facilitate such lending, a credit guarantee scheme (the Guarantee Fund for the Promotion of Competitiveness, FGCP) was established in 1997. Created with resources of the National Treasury and managed by BNDES, the FGCP guarantees part of the credit risk incurred by financial institutions in operations with SMEs that make use of BNDES's financing lines. FGCP covers

between 70 and 80 percent of the credit risk of the new operation and is granted according to a criterion that considers both the size and the region of the borrowing enterprises.

The fee charged for the provision of the FGCP is 0.15 percent of the loan times the number of months corresponding to the maturity of the loan. Paradoxically, the FGCP can significantly reduce the overall cost of lending because the fees of accredited financial institutions cannot exceed 4 percent a year in BNDES loans that come with FGCP.

The FGCP has several advantages. The final lender can obtain a significant fee from an almost risk-free operation, whereas by regulation only the part of the loan not covered by the FGCP is considered for the risk-weighted capital requirements. This implies that, for the borrower, the cost of lending tends to be significantly lower, as does the value of the collateral requested by the lender. In addition, the lower cost of borrowing, compared with market rates, increases the capacity and the incentives to honor these loans with no delay. As a result, default rates have been very low, and therefore the de facto use of the fund to cover defaulted loans has been limited.

¹ Although such fees are in principle negotiated freely, there is indirect pressure by BNDES to maintain the fees within a range. This pressure is exercised by favoring those accredited agents that offer the smaller fees to the final borrowers.

such experimentation produces positive externalities by generating knowledge that is difficult for the bank to keep for itself. Trained agents can leave the bank to work with competitors, for example, and new ideas are easy to copy.

This justifies the provision of subsidized technical assistance or outright grants to banks and other financ-

ing agents to encourage them to explore new technologies and develop the necessary expertise in order to expand credit to SMEs. In fact, this is precisely what has been done very successfully in recent years in the area of microfinance. Perhaps it is time now to build on this positive experience to implement a similar policy for SMEs.

APPENDIX TABLE 14.1 DEFINITIONS AND SOURCES OF VARIABLES

Variable	Definition	Source
Financing constraints	Financing as a general constraint (no obstacle = 1, minor obstacle = 2, moderate obstacle = 3, major obstacle = 4)	WBES
Financing, major obstacle	Financing constraint as a major obstacle (dummy = 1 if financing constraint = 4)	WBES
Percentage of finance from banks	Share of financing from banks (local and foreign)	WBES
Finance from banks	Financing from banks (dummy = 1 if financing from banks is greater than 0)	WBES
Small	Firm size 1 to 50 employees	WBES
Medium	Firm size 51 to 500 employees	WBES
Large	Firm size 501 or more employees	WBES
Age	Firm age, continuous variable	WBES
Exporter	Dummy, 1 if firm exports	WBES
Foreign ownership	Dummy, 1 if firm has foreign owners	WBES
Government ownership	Dummy, 1 if firm is state-owned	WBES
Sector dummies	Agriculture, manufacturing, services, construction, others	WBES
Pessimism	As Love and Mylenko (2003) define the average of the quality perceptions of the firm's manager with respect to quality of education, public health, customs, courts, public works, police, military, central government, parliament, postal system, telephone	WBES
GDP per capita	Average GDP per capita in 1998–2000, in thousands international purchasing power parity dollars	World Bank's World Development Indicators
Creditor rights	Creditor rights	World Bank's Doing Business Web page; La Porta and others (1998)
Rule of law	Average rule of law	World Bank's Governance Web page; Kaufmann, Kraay, and Mastruzzi (2003)
Effective rule of law	Interaction between creditor rights and rule of law	World Bank
Private credit registry	Private firm or a nonprofit organization that maintains a database on the standing of borrowers in the financial system; its primary role is to facilitate exchange of credit information among banks and financial institutions	World Bank Doing Business
Public credit registry	A database managed by the public sector, usually by the central bank or superintendent of banks, that collects information on the standing of borrowers in the financial system and makes it available to financial institutions	World Bank Doing Business
Government's domestic debt over total domestic credit	Claims on governments and other public entities (in current local currency) over the sum of claims on governments and other public entities and claims on the private sector (in current local currency) each year for 1990–2000; period average	IMF's International Financial Statistics
GDP volatility	GDP volatility calculated as the standard deviation of GDP in the 1990s	World Bank's World Development Indicators
Bank concentration	Assets of the three largest banks as a share of assets of all commercial banks	BANKSCOPE
Financial development	Average total credit over GDP during the 1990s	World Bank data
State-owned banks	Share of state-owned banks	Barth, Caprio, and Levine (2004)
Foreign-owned banks	Share of foreign banks	Barth, Caprio, and Levine (2004)

APPENDIX TABLE 14.2 | **FINANCING AS A MAJOR OBSTACLE AND SHARE OF FINANCING FROM BANKS**

Independent variable	Dependent variable							
	Financing as a major obstacle	Share of financing from banks	Financing as a major obstacle			Share of financing from banks		
	1	2	3	4	5	6	7	8
Small	0.103 (0.022)***	-22.957 (3.068)***	0.099 (0.029)***	0.101 (0.031)***	0.094 (0.065)	-20.949 (3.936)***	-28.601 (4.531)***	0.927 (7.085)
Medium	0.073 (0.020)***	-6.834 (2.652)***	0.048 (0.026)*	0.055 (0.028)*	0.017 (0.062)	-3.411 (3.535)	-3.687 (4.098)	-5.524 (6.670)
Log age	-0.007 (0.007)	-1.909 (1.021)*	-0.011 (0.007)	-0.011 (0.007)	-0.01 (0.007)	-1.822 (1.001)*	-1.736 (0.998)*	-1.812 (0.999)*
Exporter	0.023 (0.016)	8.801 (2.197)***	0.027 (0.016)	0.027 (0.016)*	0.027 (0.016)	8.163 (2.137)***	8.476 (2.132)***	8.379 (2.132)***
Foreign ownership	-0.124 (0.017)***	-1.246 (2.556)	-0.121 (0.018)***	-0.121 (0.018)***	-0.12 (0.018)***	-3.12 (2.429)	-2.803 (2.423)	-2.834 (2.429)
Government ownership	0.093 (0.021)***	-6.237 (3.087)**	0.099 (0.023)***	0.098 (0.023)***	0.085 (0.023)***	-5.744 (3.207)*	-8.044 (3.230)**	-8.522 (3.275)***
Latin America			0.238 (0.088)***	0.24 (0.088)***	0.176 (0.091)*	44.678 (15.473)***	39.763 (15.585)**	40.309 (15.927)**
Latin America, small			0.035 (0.046)	0.034 (0.047)	0.039 (0.075)	-2.435 (5.402)	5.207 (5.835)	-24.473 (7.994)***
Latin America, medium			0.057 (0.043)	0.05 (0.045)	0.088 (0.074)	-7.513 (4.978)	-7.226 (5.385)	-5.476 (7.521)
OECD				-0.132 (0.077)*			43.82 (23.347)*	
OECD, small				-0.005 (0.069)			29.694 (8.177)***	
OECD, medium				-0.036 (0.065)			-1.773 (7.770)	
Pessimism	0.073 (0.009)***		0.073 (0.009)***	0.073 (0.009)***	0.074 (0.009)***			
Observations	6,714	5,141	6,714	6,714	6,714	5,141	5,141	5,141
Number of countries	63	59	63	63	63	59	59	59
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
All region-size interactions			No	No	Yes	No	No	Yes
Test small = medium								
Chi2 (1)	3.15	60.92***						
Prob. >Chi2	0.076	0						

* Significant at 10 percent.

** Significant at 5 percent.

*** Significant at 1 percent.

Note: See Appendix Table 14.1 for descriptions of the variables. Regressions 1, 3, 4, and 5 are from a probit model with marginal effects coefficients. Robust standard errors are in parentheses. Regressions 2, 6, 7, and 8 are Tobit regressions (0, 100). Columns 3 and 6 compare the difference due to firm size in Latin America with that in the rest of the world. Columns 4 and 7 do the same vis-à-vis the rest of the developing world (thus excluding the OECD), while columns 5 and 8 compare Latin America with the OECD.

Source: IDB calculations.

APPENDIX TABLE 14.3 EFFECTS ACROSS THE BOARD

Independent variable	Dependent variable											
	Financing constraints considered a major obstacle						Share of financing from banks					
	1	2	3	4	5	6	7	8	9	10	11	12
Small	0.121 (0.026)***	0.100 (0.026)***	0.099 (0.025)***	0.091 (0.024)***	0.119 (0.026)***	0.087 (0.026)***	-23.027 (5.642)***	-25.080 (5.466)***	-22.300 (5.320)***	-19.335 (5.701)***	-26.271 (5.427)***	-23.083 (6.271)***
Medium	0.082 (0.019)***	0.078 (0.019)***	0.076 (0.019)***	0.058 (0.019)***	0.082 (0.019)***	0.054 (0.022)**	-3.893 (4.287)	-5.271 (4.492)	-3.534 (4.128)	-6.745 (4.923)	-5.265 (4.518)	-8.784 (5.438)
Log age	-0.012 (0.010)	-0.013 (0.010)	-0.019 (0.011)*	0.004 (0.012)	-0.013 (0.011)	0.005 (0.012)	4.914 (1.761)***	3.731 (1.746)**	4.001 (1.575)**	2.470 (1.767)	2.806 (1.625)*	2.263 (1.912)
Exporter	0.016 (0.021)	0.007 (0.024)	0.002 (0.019)	-0.018 (0.022)	0.008 (0.019)	0.002 (0.021)	10.503 (3.304)***	9.058 (3.672)**	9.019 (3.053)***	10.333 (3.414)***	7.147 (3.507)**	9.407 (4.039)**
Foreign ownership	-0.131 (0.018)***	-0.135 (0.018)***	-0.122 (0.018)***	-0.102 (0.022)***	-0.124 (0.019)***	-0.101 (0.022)***	-4.084 (3.189)	-4.796 (3.373)	-2.937 (3.114)	-3.535 (3.485)	-5.969 (3.281)*	-5.767 (3.649)
Government ownership	0.102 (0.030)***	0.091 (0.029)***	0.11 (0.028)***	0.076 (0.037)**	0.116 (0.029)***	0.086 (0.038)**	14.046 (6.136)**	16.685 (6.246)***	15.198 (6.103)**	5.664 (5.340)	15.253 (6.595)**	5.731 (6.037)
Pessimism	0.070 (0.010)***	0.070 (0.010)***	0.071 (0.009)***	0.058 (0.009)***	0.070 (0.010)***	0.058 (0.009)***						
GDP volatility	0.000 (0.000)	0.000 (0.000)*	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	-0.001 (0.001)	-0.001 (0.001)	-0.002 (0.001)	-0.001 (0.001)	-0.001 (0.001)	0.000 (0.002)
Effective creditor rights	-0.347 (0.093)***				-0.345 (0.084)***	-0.392 (0.148)***	18.865 (12.038)				1.975 (11.269)	14.237 (31.911)
Public credit registry		0.052 (0.037)			0.054 (0.032)*	0.007 (0.044)		10.270 (5.324)*			8.194 (5.108)	9.815 (7.896)
Private credit registry		-0.082 (0.042)*			-0.066 (0.047)	0.020 (0.076)		22.176 (4.595)***			19.562 (5.759)***	16.342 (11.079)
Government domestic debt / total domestic credit			0.213 (0.077)***		0.126 (0.075)*	0.087 (0.107)			-38.264 (8.780)***		-24.124 (10.386)**	-14.378 (14.861)

Bank concentration	0.136 (0.138)	0.003 (0.105)	0.236 (0.169)	5,915	3,928	5,109	5,040	5,136	3,178	4,740	14.128 (36.401)
Financial development	-0.001 (0.001)		0.001 (0.001)						0.105 (0.195)	(15.135)	-0.030 (0.240)
Financial development * state-owned banks	0.000 (0.000)		0.000 (0.000)						-0.001 (0.000)		-0.002 (0.000)
Financial development * foreign-owned banks	0.000 (0.000)**		0.000 (0.000)						0.004 (0.003)		0.001 (0.005)
Observations	6,530	6,459	6,490	4,122	5,915	5,109	5,040	5,136	3,178	4,740	2,987
Number of countries	60	59	60	37	55	57	56	58	35	53	33
Regional fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

* Significant at 10 percent.

** Significant at 5 percent.

*** Significant at 1 percent.

Note: See Appendix Table 14.1 for descriptions of the variables. Regressions 1 to 6 are from a probit model with marginal effects coefficients. Robust standard errors are in parentheses. Regressions 7 to 12 are interval regressions centered at 0 and 100.

Source: IDB calculations.

APPENDIX TABLE 14.4 | MARGINAL EFFECTS ON SMES

Independent variable	Share of financing from banks									
	1	2	3	4	5	6	7	8	9	10
Small	0.098 (0.031)***	0.051 (0.045)	0.094 (0.028)***	-0.041 (0.056)	0.073 (0.042)*	-32.546 (5.313)***	-36.636 (9.062)***	-17.047 (4.764)***	-20.851 (9.597)**	-37.798 (6.434)***
Medium	0.075 (0.029)**	0.033 (0.039)	0.073 (0.027)***	0.010 (0.053)	0.029 (0.039)	-5.166 (4.267)	-0.877 (7.476)	-4.884 (4.253)	-17.170 (8.823)*	-15.737 (6.407)**
Log age	-0.007 (0.008)	-0.008 (0.008)	-0.013 (0.008)	-0.008 (0.008)	0.008 (0.009)	1.957 (1.424)	1.950 (1.467)	1.785 (1.335)	1.807 (1.361)	-0.045 (1.438)
Exporter	0.025 (0.018)	0.026 (0.018)	0.018 (0.017)	0.021 (0.017)	0.018 (0.020)	4.956 (2.674)*	5.232 (2.823)*	4.789 (2.625)*	5.285 (2.621)**	6.591 (2.880)**
Foreign ownership	-0.129 (0.017)***	-0.131 (0.017)***	-0.118 (0.017)***	-0.131 (0.017)***	-0.100 (0.020)***	-3.970 (3.525)	-4.021 (3.648)	-3.812 (3.328)	-4.902 (3.370)	-2.540 (3.800)
Government ownership	0.099 (0.022)***	0.098 (0.024)***	0.111 (0.024)***	0.108 (0.023)***	0.077 (0.029)**	13.770 (5.331)***	11.135 (5.346)**	11.927 (5.094)**	11.164 (4.817)**	0.583 (4.559)
Pessimism	0.073 (0.009)***	0.074 (0.010)***	0.074 (0.009)***	0.072 (0.010)***	0.060 (0.010)***					
GDP volatility * small	0.000 (0.000)*	0.000 (0.000)**	0.000 (0.000)**	0.000 (0.000)***	0.000 (0.000)	0.002 (0.001)	0.002 (0.001)*	0.001 (0.001)	0.001 (0.001)	0.000 (0.001)
GDP volatility * medium	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)**	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	0.002 (0.001)
Effective creditor rights * small	0.062 (0.098)					30.619 (13.498)**				
Effective creditor rights * medium	-0.013 (0.102)					9.801 (12.405)				
Private credit registry * small		0.042 (0.042)					15.373 (7.438)**			
Private credit registry * medium		0.019 (0.038)					0.010 (6.807)			
Public credit registry * small		0.051 (0.043)					2.881 (7.717)			
Public credit registry * medium		0.037 (0.040)					-5.519 (6.475)			
Government debt / total domestic credit * small			0.059 (0.085)							-30.837 (10.552)***

