

Essays in Corporate Finance

by

Alejandro Herman Drexler

M.A. in Applied Economics, Universidad de Chile, 2001

Submitted to the Alfred P. Sloan School of Management
in partial fulfillment of the requirements for the degree of

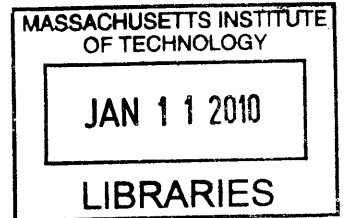
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Abstract

This thesis consists of three essays covering topics in empirical corporate finance with an emphasis on banking relationships and its effect on liquidity constraints and business growth. In particular, it investigates the effect of monetary capital and human capital constraints and the role of banking relationships to relax both constraints. The first essay studies how the number of bank relationships affects the liquidity constraints of businesses. The second essay investigates how accounting training can affect the liquidity constraints of entrepreneurs finally the third essay studies the effect of credit insurance as a mechanisms to reduce liquidity constraints. Further details of each essay are included below:

In Chapter 1, I empirically explore whether firms have a target for the number of banks from which they borrow, and whether having multiple bank relationships has an impact on firms' liquidity situation. A bank merger in Chile provides a quasi-experiment as it constitutes an exogenous reduction in the number of lenders for firms that were previously borrowing from both merging banks. I find that a significant percentage of firms whose number of bank relationships was reduced by the merger regain their original number of lenders. In particular, firms whose number of bank lending relationships was reduced from 2 to 1 as a result of the merger have a 23% higher probability of adding a new bank lending relationship in the 5 years following the merger compared to similar firms unaffected by the merger. Overall, I find that a reduction in firms' number of bank lenders resulting from the merger reduced firms' access to credit. In particular, a reduction from two to one bank lending relationship on average generated a 14.4% decrease in loan size for the affected companies compared to firms unaffected by the merger.

In Chapter 2 (joint work with Antoinette Schoar and Greg Fischer) We conduct a randomized impact evaluation of a training program for micro-entrepreneurs in the Dominican Republic that allows us to identify the effects of cash management and accounting techniques on business practices and business performance. To a randomly-selected fraction of the entrepreneurs enrolled in the training program we also provided on-site accounting and cash management advice. We find that micro entrepreneurs are reluctant to incorporate complex and time-consuming accounting practices into their businesses, however, simpler cash flow management practices were widely adopted by trained entrepreneurs. People who were taught basic cash flow management techniques increased their sales up to 80%. The increase in sales during bad performance periods was substantially more significant than the average increase in sales. This suggests that the most important mechanism through which training improved performance was by reducing the effect of drawbacks in the businesses. Complex accounting techniques only increased sales when combined with on-site

advice, most likely because these practices were not consistently implemented when on-site advice was not provided.

In Chapter 3 (joint work with Kevin Cowan and Álvaro Yañes), we use Partial Credit Guarantee Schemes in Chile to study how such a government intervention in the financial system can affect the access that entrepreneurs have to the formal financial system. We also explore how these schemes affect the default rates on the guaranteed loans. We find that partial credit guarantee schemes increase the number of loans and the aggregate amount lent to small and medium size businesses. In addition, we find that credit guarantees increase the debt capacity of individual entrepreneurs, holding assets fixed. We also find that Credit Guarantees increase default rates, but the evidence suggests that this result is explained mainly by misalignment of bank incentives rather than moral hazard in the context of client practices.

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I have also benefited from discussions and interaction with several other Sloan faculty and visiting faculty. While I am certain to leave out important names from this list (apologies), the following faculty have been helpful in several ways and deserve explicit thanks: Nittai Bergman, Serdar Dinc, Carola Frydman, Stewart Myers, and Jun Pan.

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Chapter 1

The Effect of the Number of Lending Banks on The Liquidity Constraints of Firms: Evidence From a Quasi-experiment

1.1 Introduction

Borrowing from multiple banks is common practice among firms. Most new firms begin by borrowing from a single bank, but soon add new bank lending relationships. Farinha and Santos (2002) show that in Portugal 28% of firms have more than one bank lending relationships after two years of operations, and 35% of the firms have more than two bank lending relationships four years after startup.

In a frictionless market, as proposed by Modigliani and Miller (1958), the number of bank lending relationships a firm uses will have no impact on its value or the funds available to it. However, there are multiple potential frictions, such as commitment problems, information asymmetries and transaction costs that can make a firm's number of bank lending relationships affect its liquidity situation. There is ample theoretical work that studies these frictions (see Rajan (1992), Bolton and Scharfstein (1996), and Thakor (1996)). However, the literature is far from providing a unanimous prediction as to how the number of lenders affects firm liquidity, as different models yield different

implications. Furthermore, the empirical literature has been unable to satisfactorily corroborate the importance of these frictions because sample selection, endogeneity and unobservable variable biases pose serious challenges to empirical inference.

This chapter attempts to address these problems by studying an exogenous shock to the number of bank lending relationships that occurred in Chile during 2002 and unexpectedly reduced the number of bank lenders for some firms. This is the first study that uses an exogenous source of variation to identify the effect of the number of lenders on firms' liquidity constraints. This chapter focuses on two central questions: (1) Do firms set targets for their number of bank relationships? (2) Does the number of bank relationships a firm establishes impact the amount of credit that the firm can access?

Turning to the first question - whether firms have specific targets for their number of bank relationships - if the number of lending relationships a firm establishes affects costs and/or access to credit, we should observe firms adjusting their number of lenders to minimize costs and maximize credit availability. However, if these frictions are unimportant we should observe that firms do not seek a specific number of bank lending relationships. I find evidence that strongly suggests that firms have targets for their number of bank relationships. In fact, I observe that a significant percentage of firms who saw their number of bank relationships reduced by the merger return to their pre-merger number of lenders. For example, the firms whose number of banks was reduced from two to one have a 23.2% higher likelihood of adding a new lending relationship compared to similar firms unaffected by the merger.¹

Secondly, I study whether having multiple bank relationships has an impact on the firm's liquidity situation. I find that on average the decrease in the number of lenders reduced the total loan size of firms affected by the shock. For example, a reduction from two to one bank lending relationship on average generated a 14.4% decrease in total loans to the affected companies, as compared to similar companies unaffected by the merger.

These results were obtained by studying a natural-experiment generated by the merger of two major banks in Chile during 2002, which was a (minor) consequence of the merger of two financial conglomerates in Spain that each owned significant stakes in the two Chilean banks. As the Chilean banks made up less than 1% of the value of the Spanish conglomerates it is reasonable to assume that the merger of the Spanish conglomerates was not driven by the desire to merge their Chilean financial holdings. In turn, this makes it plausible that the reduction in bank relationships caused

¹Within 5 years of the merger.

by the merger was an exogenous shock for firms with relationships with both banks before the merger.

The treatment group in this quasi-experiment is composed of firms that were borrowing from both of the merging banks prior to the merger, while the control group is composed of firms that were borrowing from banks that did not merge.² After the merger, the companies in the treatment group had only one bank lending relationship, while firms in the control group still had two bank lending relationships. I use a difference-in-difference approach to estimate the change in the probability of adding new bank lending relationships after the merger, and to estimate the effect of the merger on credit availability.

The data for this study is from the database of the Bureau for Bank Regulation in Chile (SBIF). This database contains financial information on the three million individuals and firms that have debt in the formal Chilean financial system. From this database, I constructed a panel with the financial information on the 6,000 firms included in the treatment group and the 13,000 firms in the control group. This panel contains yearly information for the period 1998-2006.

The results in this chapter strongly suggest that firms have specific targets for the number of banks they wish to borrow from. In the five years following the merger, firms whose number of lenders were reduced by the merger had on average a 18.7% higher probability of adding a new bank lending relationship compared to similar firms unaffected by the merger. This effect is strongest for firms whose number of banks were reduced from two to one; these firms have a 23.2% higher probability of adding a new bank lending relationship in the five years following the merger, compared to similar firms unaffected by the merger. The effect decreases as the number of bank relationships per firm increases, as can be seen in the table below. This diminishing effect is not surprising, since we expect that the effect of the merger should be strongest for firms that have less outside financing options.

Firms whose number of banks was reduced	from 2 to 1	from 3 to 2	from 4 to 3	average (all)
Increased probability of adding a banking relationship compared to firms unaffected by the merger	23.2%	18.8%	14.1%	18.7%

²To make the control and treatment groups comparable, I exclude from the sample firms receiving credit from a government owned bank, and firms receiving loans from a bank that was less than 50% of the size of the target.

I also find that the probability of adding a new bank lending relationships in the five years following the merger does not depend on loan size (the effect ranges from 16.41% to 17.17% and the differences are not statistically significant). However, firms in the fifth loan size quintile add new bank relationships more quickly than firms in the remaining loan quintiles. Within two years of the merger, firms in the fifth loan quintile already have a 14.6% higher likelihood of adding new bank lending relationships compared to similar firms unaffected by the merger. Firms in the remaining loan quintiles have only a 9.3% higher probability of adding new bank lending relationships in the same time frame. This suggests that it is easier for firms in the fifth loan quintile to add new bank lending relationships, probably because they experience weaker asymmetric information problems.

The analysis of this quasi experiment also suggests that the decrease in the number of lenders generates a reduction in the availability of credit. In particular, firms whose number of lenders was reduced from two to one as a result of the merger experience a reduction of 14.5% in their total loan amount, as compared to similar firms unaffected by the merger. I also find that firms try to offset this reduced access to credit by establishing new bank lending relationships. However, even with these additional banking partners, most firms are not able to fully offset the reduction in credit availability. A potential explanation is that adverse selection makes it difficult for firms to start new bank lending relationships and when firms are able to establish new relationships, the new lending partners may only be willing to lend a fraction of what the original lender was willing to lend. While large firms with many bank lending relationships before the merger are able to fully offset the reduction in access to credit, small firms cannot, even if they had multiple lenders before the merger. This suggests that adverse selection can reduce firms' access to credit, even in the context of pre-existing bank relationships.

One explanation for the significant reduction in the availability of credit for firms affected by the merger is that the newly merged bank decided to diversify its portfolio post-merger, believing itself to be over-exposed to certain clients. However, the average loan size (even after the merger) is negligible compared to the total assets of the bank. Nonetheless, such a diversification explanation is still plausible if there are agency problems between the bank and its loan officers. Since loan officers are usually paid according to the size and default rate of their portfolio, and given that their portfolio is a fraction of the bank's total portfolio, loan officers may have incentives to over-diversify.

A second mechanism, modeled by Bolton and Scharfstein (1996), is that an increase in the number of lenders may complicate firm renegotiation in the event of financial distress: if firms

anticipate a difficult renegotiation process this may deter them from strategically defaulting on the loan. This can help explain my finding that a reduction in the number of lenders reduces access to credit. According to the Bolton and Scharfstein model a reduction in the number of lenders will increase the probability of a successful loan renegotiation. If firms anticipate lower renegotiation costs they may engage in more risky projects, which in turn will increase the default rate. Furthermore, even if firms do not engage in riskier projects they may have incentives to strategically default in order to renegotiate the terms of the loan. Cutting loan sizes could be the bank's reaction to firms' increased incentives to engage in risk shifting in their investment decisions and to strategically default.³

A third explanation is provided by Thakor (1996). In his model, the bank observes the quality of the firms with noise, so good firms risk of being taken as poorly performing clients and being denied credit. If the noise in the screening process is not perfectly correlated amongst banks then increasing the number of lending relationships should reduce the risk of being mistakenly identified as a poorly performing client.

A potential concern with the methodology used in this chapter is that the results could be driven by changes in the post-merger lending policy of the merged banks. To address this concern, I test whether the findings in the quasi-experimental analysis are also observed for firms that had a single bank lending relationship with one of the banks that merged. If there was a change in lending policy, these firms would also be affected by the change. However, the merger did not affect their number of bank relationships. I then perform a difference-in-difference analysis for firms with a single lending relationship with one of the merged banks, relative to a comparison group of firms that had a single bank lending relationship with a bank outside of the merger. If my findings in the quasi-experiment were driven by changes in the lending policy of the merged bank, the findings should also hold in the estimation for firms with single bank relationships. To test if my findings were driven by policy changes I test whether (1) firms with a single lending relationship with one of the merged banks are more likely to add new bank lending relationship after the merger, compared to firms with a single lending relationship from a bank that did not merge; and (2) whether firms with a single lending relationship with one of the merging banks experience a reduction in their total loan amount compared to firms with single lending relationships that were unaffected by the

³In the appendix section I show that only a fraction of the sample experiences difficulties in renegotiating loans. This suggests that even though Bolton and Scharfstein's model can explain part of the reduction in access to credit, an alternative mechanism is needed to explain the reduction for the firms for which the ability to renegotiate loans was unaffected.

merger.

I find that firms with a single bank lending relationship with one of the merged banks were 2% less likely to add a new bank lending relationship after the merger. This result is in the opposite direction to the effect for firms that were borrowing from both merging banks pre-merger, providing further evidence that firms that see their number of lenders reduced by the merger add new bank lending relationships after the merger because they have specific targets for their number of lenders, and not because they face a change in the lending policy of the merged bank.

Second, I find that loan size is 2.9% smaller for firms borrowing from the merging banks compared to loan size of firms borrowing from banks that did not merge. However this reduction in the availability of credit is five times larger for firms that borrowed from both merging banks pre-merger compared to firms that borrowed only from one of the merging banks (a 2.95% reduction for firms that borrowed from one of the merging banks compared to a 14.35% reduction for firms that borrowed from both merging banks). This shows that a potential change in the policy of the merged bank does not explain the reduction in the loan amount and supports the hypothesis advanced here that the reduction in loan size is a result of the decrease in the number of lenders.

In short, this robustness check provides grounds for confidence that the results of the quasi-experiment are due to a change in the number of bank relationships and not the result of a changed post-merger lending policy.

The rest of the chapter is organized as follows. Section 1.2 provides a brief review of related work, Section 1.3 details the methodology, Section 1.4 presents the data and summary statistics, Section 1.5 presents results, Section 1.6 presents a robustness check and Section 1.7 concludes.

1.2 Related Literature

1.2.1 Theoretical Literature

There is ample theoretical literature that explores the relationship between firm liquidity constraints and the number of banks they employ. In this section, I present the most relevant theoretical models that study how the number of lending banks firms employ impact the availability of funds, the probability of defaulting on loan payments and the probability of successfully renegotiating loans.

Rajan (1992) develops a model where firms choose between informed lenders and arm's-length

investors. The benefit of borrowing from informed lenders is that they will closely monitor the firm, make informed lending decision and give advice on the investment decisions of the firm. Lending will be more flexible, in the sense that the lender will adapt the loan to the needs of the firms. The cost of borrowing from informed lenders is that they can extract rents from the firm, because the bank gains monopoly power by having information about the firms that is difficult to obtain by competitor banks. On the other hand, arm's length lending mitigates the rent extraction problem, but is less likely to monitor or control the investments and adapt the loan to the needs of the firm. In Rajan's framework, firms with a single "informed" lender will have a more flexible access to finance and therefore less inefficient default than firms that engage in "arm's length" lending. Rajan's model suggests that the most important reason to engage in multiple lending is to reduce the capacity of the informed lender to extract present and future rents. Nonetheless, Von Thadden (1995) shows that rent extraction can also be mitigated by long term contracting with a single bank. This suggest that firms should have other reasons to lend from multiple lenders beyond mitigating rent extraction. The findings in my work indeed suggest that firms chose to engage in multiple bank lending relations for diverse reasons.

Gertner and Scharfstein (1991) and Scharfstein and Bolton (1996) model the renegotiation problems associated with widespread debt holding. Gertner and Scharfstein (1991) argue that renegotiation problems arise due to coordination problems among bondholders. More specifically, debt holders who do not renegotiate can see the value of their bonds rise if the rest of the bondholders forgive some of the debt. This can lead some bond holders to hold out from renegotiation, causing a breakdown in the process. Scharfstein and Bolton (1996) argue that the costs at which the creditors can sell the firm's assets, in the event of a liquidation, increases with the number of lenders. This increase in the liquidation value reduces the incentives for strategic default, but also increases the probability of inefficient liquidation in the event of liquidity defaults. The higher risk of inefficient liquidation present in these models may deter firms from strategically defaulting, thus reducing default rate. In turn, the decrease in the probability of strategic default may increase the loan size that banks are willing to lend ex ante.

Thakor (1996) focuses on the effect of capital requirement on aggregate bank lending. To answer this question he models the firm's choice about the number of lenders they seek when they need a bank loan. Thakor (1996) assumes that banks will screen firms with noise, therefore creditworthy firms will prefer applying to more banks to reduce the probability of being denied

credit. However applying to more banks will reduce the incentives for banks to screen, because the higher competition will reduce the likelihood of being able to extract the firm's rent in the future. The companies will therefore have an optimal number of banks to apply that balances this two effects. Even though Thakor focuses on the number of banks a firm applies to, it is easy to extend his model to the number of banks a firm borrows from. Indeed if we think that banks will decide on the loan size based on noisy screening (instead of deciding between lending or not lending) then a firm may want to borrow from multiple lenders to improve their liquidity situation.

1.2.2 Empirical Studies

Gilson, Kose and Lang (1990) find that having more debt owed to banks, and less distinct classes of debt bond holders, increases the probability of a private renegotiation success. However, Asquit, Gertner and Scharfstein (1994) find that the fraction of public debt does not have a significant effect on renegotiation success. Rather, they find that the number of times the firm issues debt (which they use as a proxy of debt complexity) is associated with renegotiation success. Although these papers disagree as to what causes renegotiation complications, they come to the same conclusion that more widespread lending is associated with a lower probability for renegotiation success.

In more recent empirical work, Brunner Krahen and Pieter (2007) investigate the effect that multiple lending has on renegotiation success by studying bank pools, an institution that coordinates the action of banks during debt reorganization, in Germany. Brunner Krahen and Pieter find that the probability for successful renegotiation is higher and time spent in default is shorter when distressed firms have fewer bank lending relations. They also show that pool formation is more likely when the debt is evenly distributed among banks, suggesting that even distribution facilitates coordination.

The previous three papers discuss the implication of having multiple lenders on renegotiation. As discussed in the theory section Bolton and Scharfstein (1996) predict that the potential renegotiation complication will have implications on the lending decisions of the banks. In the rest of this section I briefly describe the papers that study the relationship between number of lenders and liquidity.

Petersen and Rajan (1994), use a data set on small businesses in the United States to explore the benefits of relational lending. They find that concentrated borrowing is correlated with greater availability of credit. They also find that adding one additional banking partner increases late

payments by almost two percentage points. However, they find little evidence that the price of loans changes when lending is more concentrated. In my study, I also explore the extent to which concentrated borrowing affect the total outstanding loan and the probability of default.

An empirical work closely related to my study is Farinha and Santos (2002). Using a data set on Portuguese firms, they explore the factors that lead companies to switch from one bank relationship to multiple banking relations. They argue there are two principal reasons why a firm would wish to increase its number of banking partners. First, a firm may wish to expand banking relations if they have had rapid growth and one bank can no longer meet their financial demands. It also follows that firms that have better growth opportunities may be inclined to using multiple banks. Second, companies with a low indication of profitability, or that are in arrears, may expand their bank relations to continue to receive financing.

While the aforementioned empirical studies set forth a strong framework from which to study the impact of multiple banking, a common problem among the literature is that firms endogenously select their number of banking partners (or bond financing). This problem is not fully addressed in the former papers and therefore the interpretation of the results is challenging. In my work, I use an exogenous shock to isolate the effect that the number of lenders has on multiple banking from the inherent characteristics that lead firms to select different debt structures.

1.3 Methodology

The majority of empirical studies that examine the impact that multiple banking has on firms are challenged by the fact that firms internally decide their quantity of banking partners. I use a quasi-experiment that provides an exogenous reduction to the number of lenders some firms use. This allows me to identify the effect of the number of lenders in the liquidity situation of the firm.

The quasi-experiment I study was a result of the merger of two major banks in Chile in August 2002. The merger generated an exogenous reduction in the number of banks for firms that previously borrowed from both of the merged banks. The merger was a result of the union of two financial holdings in Spain, Banco Santander and Banco Central Hispano, that merged into Banco Santander Central Hispano (BSCH). Banco Santander was also the owner of Banco Santander Chile, while Banco Central Hispano had a 40% participation in Banco de Santiago. In April 2002 BSCH bought 35% of Banco de Santiago raising its participation from 40% to 75%. Banco Santander Chile and Banco de Santiago merged their operations in August 2002, after the Chilean antitrust bureau

declared that the merger was not a threat for the competition in the Chilean financial markets.⁴ However, the banks in Chile represented less than 1% of the operations of the holdings in Spain. Therefore, it can be fairly assumed that the merger was driven by contingencies in the Spanish financial markets and not by contingencies in the Chilean markets.

The merged bank had a dominant position in the Chilean bank industry with 27% of the market share, its closest competitor was Banco de Chile with 22% market share. Given the magnitude of the merger, it raises concerns regarding potential changes in the lending policies of the merged banks. I address these concerns in the robustness checks section. A second concern is that the banks could have merged for endogenous reasons. We already make the point that the merger was triggered by the merger of two holdings in Spain, other than that the two banks had no commercial ties before the merger of the Spanish Holdings. This makes it unlikely that the two banks may have merged in the absence of the BSCH merger.

In my analysis, the treatment group consists of firms that before the merger were borrowing from both of the merged banks. The control group consists of firms that had loans from banks that did not merge.⁵ After the merger, the companies in the treatment group end up having only one bank lending relationship. However firms in the control group still have two bank lending relationships after the merger.

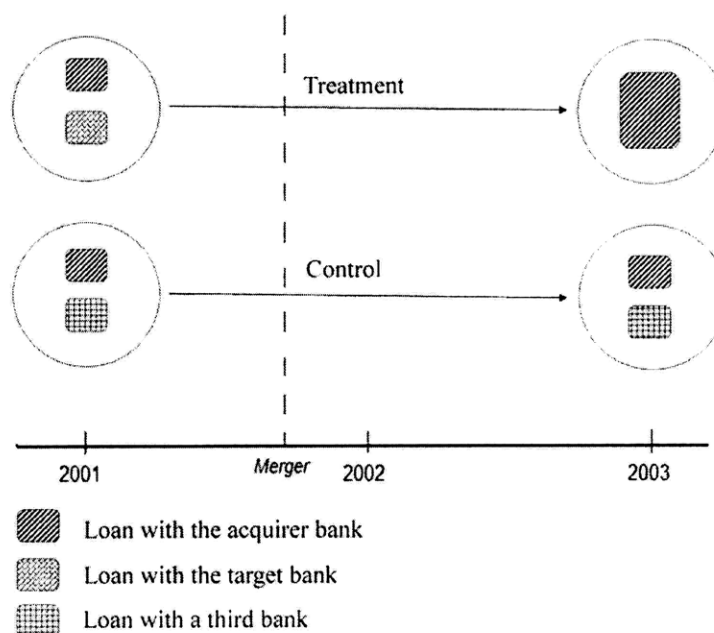
In Figure 1 I show a diagram of the loans for firms in the treatment and firms in the control groups. We see in the picture that both firms in the treatment group and firms in the control group have two bank lending relationships before the merger. However, after the merger firms in the treatment group have only one bank lending relationship.

To further sharpen the identification in my analysis, I construct both the control group and the treatment group with firms that prior to the merger had a bank lending relationship with the acquirer, this way I aim to make both groups more similar. Firms in the treatment group have a second bank lending relationship with the bank that was acquired while firms in the control group have a second bank lending relationship with a bank that was untouched by the merger. Furthermore I drop from the control firms that had as a second lender a publicly owned bank, or a bank that was less than 50% the size of the target. Government owned banks usually have political considerations in their lending policy (for details see La Porta, Lopez-De-Silanes and Shleifer 2002

⁴See Jose Tomas Morel (2003) for details

⁵For simplicity, in the methodology section I describe the setup for the analysis of a reduction from two lender to one lender. However I also estimate the more general case of a reduction from N lenders to N-1 lenders

Figure 1: Treatment and Control Groups



and Sapienza 2004). Small banks are more willing to engage in relational lending than big banks and therefore also engage in different lending practices (see Berger, Miller, Petersen, Rajan and Stein 2005). I call "potential targets" all banks that were used to construct the control groups. The assumption in my analysis is that the firms in my sample could have chosen the "potential targets" instead of the realized target as their second lending banks.

In the first table in the appendix (appendix 1) we see that the target and potential target banks are similar in the year that preceded the merger.⁶ The target and the potential target banks have similar default rates (9.92% the target vs. 9.48% the "potential target") and they have similar quantities of firms with 1, 2 and 3 bank lending relations. The target has 30.22% clients with 1 lending while the "potential target" has 33.47%. The comparison for clients with two bank lending relationships is 35.36% in the target and 36.6% in the potential target and the comparison for clients having three bank lending relationships is 21.14% in the target and 19.42% in the "potential target". One important difference between the two groups is the average loan size, which is 30% higher for the target. This difference is explained by the fact that the target had a smaller division for micro credit lending. In order to overcome this potential problem, I estimate the change in

⁶This table presents the characteristics of the target and potential target for all their clients, not only the ones included in my analysis. My analysis only considers those clients that have bank lending relationships with both the acquirer, target and potential target which is about 5% of the total clients.

the relevant variables matching by loan size. All the results in the chapter are presented by loan size. An aggregated estimation, using equal weights for each loan quintile, is also presented in each table.

1.4 Data and Summary Statistics

The data for this study are obtained from the Chilean Office for Bank Regulation (SBIF), which contains information on every firm that has debt in the formal Chilean financial system.

For each relationship between bank i and a firm j the database contains yearly information on total loan size, amount past due for 60 days or less, amount past due for less than 90 days, and amount past due for more than 89 days⁷. In addition to the variables contained in the database, I constructed following variables: the number of bank lending relations of each firm defined as the number of banks the firm borrows from, aggregated loan size defined as the total debt the firm has in the financial system, and a dummy variable for default which is defined as 1 if the firm has any amount past due in the financial system for more than 90 days and 0 otherwise.

The treatment group consists of all the firms that have bank lending relationships with both the acquirer and the target. The control group consists of firms that have a bank lending relationship with the acquirer and a bank that is not the target.

In table 1.1, I present the basic summary statistics for the treatment and the control groups before the merger. The average loan size for firms in the treatment group is US\$ 55,000 while the average loan size for firms in the control group is US\$ 30,000. To control for this difference, I divide both the firms in the treatment group and the firms in the control group into quintiles according to their loan size. By construction, the average loan size among the loan quintiles is almost identical. I make all my estimations by quintile and then evaluate the average using a simple matching estimation with equal weights for each quintile. The average loan size for firms in the first quintile is approximately US\$ 1,300 and for firms in the second quintile is US\$ 3,400. For the remainder of the quintiles, the average loan size is US\$ 6200, US\$ 12000 and US\$ 230,000, respectively.

The aggregated default rate before the merger is 7.37% for the treatment group and 8.85% for the control group. In both groups the default rate does not change monotonically with the loan size. In the treatment group, firms in the lowest loan quintile have the lowest default rate and firms

⁷The value corresponds to the variable at December the 31st of each year

in the highest loan quintile have the second lowest default rate. In the control group, firms with the lowest and highest loan size also have the smallest default rates, but firms in the highest loan quintile are the ones with the lowest default rates.

In table 1.2 I present summary statistics for the sample after the merger. The default rate increases in both the treatment and control groups, but the increase is much sharper for the treatment group (from 7.37% to 10.69%) than for the control group (from 8.85% to 10.82%). When we observe the default rates by quintile, the sharp increase in the default rates of the firms in the treatment group comes mainly from loan quintiles 3, 4 and 5. From loan quintile 4, the increase is especially dramatic (changes from 8.32 to 12.98).

1.5 Results and Discussion

The main analysis of this chapter are presented in tables 1.3 through 1.9. In tables 1.3 and 1.4 I explore how an exogenous reduction in the number of lenders affects the probability of adding a new bank lending relationship. In tables 1.5 to 1.8 I study whether the reduction in the number of lending banks affects the firm's access to credit. Finally in table 1.9 I study how a reduction in the number of bank lending relationships affects the probability of default.

In tables 1.3 and 1.4, we observe that firms have specific targets for the number of banks they wish to borrow from. In particular, in table 1.3 we see that firms whose number of bank relationships were reduced from two to one as a consequence of the merger have a 23.23% higher probability of adding a new bank lending relationship within five years after the merger, compared to similar firms which were not affected by the merger. This effect is less strong for firms whose number of banks relationships were reduced from three to two (18.83% effect) and for firms whose number of banks were reduced from four to three (14.06% effect). The diminishing likelihood of adding a second bank as the number of banking relationships increase is not surprising. One would expect that the effect of a reduction in the number of lenders would be strongest for the firms that do not have other outside financing option.

In table 1.4, I explore to what extent loan size affects the probability of a firm adding a new bank lending relationship after the reduction in the number of lenders. I find that the effect of the merger on the probability of adding a new bank lending relationship within five years after the merger is similar across all loan quintiles (ranging from 16.41% to 17.17%). However, on average, firms in the fifth loan quintile add new bank lending relationships faster than the rest of the firms.

More specifically, firms in the fifth loan quintile have a 14.61% higher probability of adding a new bank lending relationship within two years after the merger, compared to similar firms which were not affected by the merger. This represents 85% of the overall effect observed within five years. For the remaining firms, the probability of adding a new bank lending relationship within two years after the merger is 9.34% higher compared to similar firms that were unaffected by the merger. This represent 56% of the effect observed within five years for the firms in the fifth loan quintile. There are two potential explanations for this finding. First, it may be more costly for firms in the fifth loan quintile to finance with fewer lenders. If they experience a higher reduction in the access to credit or a higher increase in the interest rates. Second, it may be easier for firms in the fifth loan quintile to add new bank lending relationships. For instance, they may have lower asymmetric information problems. Using my data set, I can rule out the possibility that firms in the fifth quintile return more quickly to their original number of lenders because of a larger reduction in access to credit. In fact, in table 1.5, I show that firms in in the fifth loan quintile experience a lower reduction in credit availability than firms in the second, third and fourth loan quintile. It is likely that firms in the fifth quintile are able to return to their original number of lenders because they depend less on relational lending and more on arm's length lending. In fact, large firms usually have more verifiable cash flows and can therefore engage in arm's length lending relationships which can be initiated faster than relational lending relationships.

In tables 1.5 through 1.8, I explore how a reduction in lenders, brought about by the merger, impacts total loan size for firms. In table 1.5, I present the change in loan size for the firms whose number of bank lending relationships were reduced from two to one. Overall, there is a 14.5% decrease in the total loan amount. There are several potential explanations for this finding. The first, and, the most natural explanation, is that there was a bank wide policy change after the merger. In the robustness checks section, I rule out this explanation by studying the effect that the merger had on firms which had a single bank lending relationship with one of the merging banks. For these banks, their quantity of banking partners remained constant following the merger, but they would have been exposed to the same policy changes as the firms who had a decrease in their number of banking partners. In the robustness checks section I provide evidence that show that this effect was not driven by a change in the policy of the merged bank.⁸ A second possible explanation is that the bank wanted to diversify its portfolio because it felt that after the merger it was over exposed to certain clients. However, after the merger the average loan size is negligible

⁸A complete description of the robustness checks estimation is presented in a separated section

compared to the assets of the bank. Nonetheless, the diversification motivation is still possible if there are agency costs between the bank and its loan officers. A potential agency problem between the bank and its loan officers can be understood as follows: Loan officers have strong power in the loan evaluation process. Sometimes they directly decide on the loan size, but even if they do not directly decide the size of the loan, they can affect the decision of the bank by manipulating the information they present about the client. Loan officers are usually paid according to the growth and default rate of their portfolio. However they manage a small fraction of the banks' portfolio. Therefore they can have strong incentives to diversify their portfolio more than what is efficient for the bank. This could eventually be solved by implementing more sophisticated contracts between the bank and its loan officers, however anecdotal evidence suggest that banks do not implement complex contract with its loan officers. Furthermore in order to compensate officers for the medium or long term profitability of their portfolio, the bank should reduce the rotation of loan officers. However reducing the rotation of loan officers can increase the relevance of other friction like moral hazard in communication (see Hertzberg, Liberty and Paravisini 2008).

A third explanation for why the average loan size is smaller for firms whose number of banking partners were impacted by the merger is given by Bolton and Scharfstein (1996). In their model, an increase in the number of lenders complicates renegotiation and may deter firms from entering strategic default. Given their logic, in my quasi experiment where we see a reduction in the number of lenders, we should find the opposite effect. The reduction in the number of lenders can facilitate the renegotiation of loans in the event of default, because firms now only have to negotiate with one party. This may change the risk incentives of firms. If firms anticipate that the cost of defaulting will be lower they may ex ante be willing to engage in more risky projects thus increasing the default rate. Second, even if firms' project generate enough cash flows to pay back the loan, firms can decide to strategically default in order to renegotiate better terms for the repayment of the loan. The observed reduction in loan size may be a reaction of the bank to the expected increase in default rate generated by these effects. To understand to what extent renegotiation complications could explain the reduction in credit size I studied whether the probability of leaving default was affected by a reduction in the number of lenders. In table 5 in the appendix we observe that in average the probability of leaving default does not experience a significant increase as a consequence of a reduction in the number of lenders. However in table 6 in the appendix, where I divide the sample according to the distribution of the credit amongst the lending banks, we observe that

firms with a similar amount of credit in each on the lending banks ⁹ experience an increase in the probability of leaving default, on the contrary firms that have most of their debt in one of the lending banks experience a reduction in the probability of leaving default. This suggests that the reduction in total loan amount for firms with most of their debt concentrated in one of the lending banks is not explained by the mechanism described in Bolton and Scharfstein.

A fourth explanation is given by Thakor (1996). In his model firms will borrow from multiple lenders to reduce the risk of being denied credit. The mechanism works as follows; If banks observe the quality of the clients with noise, creditworthy firms are at risk of being labeled as poor performing clients and experience an inefficient reduction in their access to credit. By having multiple lenders firms reduce the risk of being denied credit because of noisy screening.¹⁰ In my quasi experiment, firms that were originally borrowing from both merging banks have a reduction in the number of lenders and therefore may experience an increase in the probability of being labeled as bad clients that may explain the reduction in their credit availability.

We also observe in table 1.5 that firms in the lowest loan quintile (micro credit below US\$ 3,000 in total loan amount) do not experience a reduction in access to credit. This suggests that firms in the micro credit segment benefit by concentrating their loans with only one bank, as predicted in the model of Rajan (1992) and as shown in Petersen and Rajan (1994). Nonetheless all the other mechanisms, presented previously, that go in the direction of reducing the credit availability still hold, and may offset the benefits from a more informed lending relationship (see Bolton and Scharfstein (1996) and Thakor (1996)). It is puzzling however that the effect described in Rajan (1992) is only present for firms with loans below US\$ 3,000, as it seems reasonable to assume that firms with loans below US\$10,000 would still benefit from informed bank relations. This puzzle may be explained by the model in Petersen and Rajan (1995). In their model, they describe how intense competition in the credit markets makes it difficult for banks to extract rents from firms in the future. This in turn will make it less attractive for banks to engage in relational lending. The Petersen and Rajan model could explain this puzzle if competition in the Chilean credit markets is less intense for firms with small loan sizes. In unreported estimations, I find evidence supporting this explanation: firms with loans between US\$ 3,000 and US\$ 10,000 have a 7.2% greater probability of transiting from a single to a multiple lender relationship than firms with loans below US\$ 3,000.

⁹The firms in this sub group have at least 30% of their credit in each of the lending banks.

¹⁰The only assumption that has to be made is that the noise in the screening process is not perfectly correlated among banks.

We can also note in table 5 that the reduction in the loan size is decreasing in the size of the loan for firms in the second, third, fourth and fifth quintiles. Even though this relationship is not statistically significant, it suggests that larger firms experience a smaller reduction in credit.

To better understand why larger firms experience a lower reduction in credit availability, I look to see the impact of merger on the total loan amount that firms receive from their original lenders, this analysis differs from the estimation in table 1.5 in that it excludes the loans these firms received from bank relationships started after the merger (see table 1.6). The reduction in loan size from the original lenders observed for firms in the first loan quintile is significantly lower than the reduction in loan size for firms in the higher loan quintiles. This finding supports the explanation that micro credit firms benefit from concentrating their loans with only one borrower. Contrary to what we observe in table 5, in table 6 we see that firms in the second, third, fourth and fifth loan quintiles experience a similar decrease in the lending from their original lenders. This suggest that the smaller reduction in credit availability observed in table 1.5 for firms in higher loan quintiles may be explained by a higher capacity of bigger firms to offset the reduction in credit by lending from alternative sources, and not by a smaller reduction in the loan size they got from the merging bank.

In table number 1.7, I present the reduction in total loan amount for firms that were borrowing from three or more lenders before the merger. The difference between the estimations in this table and the estimations in table 1.5 is that the firms studied in table 1.7 had three or more bank lending relationships before the merger, and therefore after the merger had at least one alternative source of funding in addition to the merged bank. The results in this table are similar to those in table 1.5. One interesting difference is that firms in the highest loan quintile that had three or more bank lending relationships before the merger do not experience a significant reduction in their total loan amount. There are at least two explanations for this finding; The first one is that firms in the highest loan quintile, with three or more lenders before the merger, did not experience a reduction in lending from the merged bank. The second explanation is that these firms experienced a reduction in credit from the merged bank but were able to offset this reduction in credit by borrowing from alternative sources. In table 1.2 in the appendix, were I present the reduction in credit size these firms received from the merged bank, we see that firms in the highest loan quintile that had three or more bank lending relationships before the merger, experienced a reduction of 28% in the lending from the merged bank, furthermore this reduction is not statistically different

from the reduction experienced by firms in the second, third and fourth quintiles. This provides evidence that large firms, having multiple lending relationships before the merger, were similarly affected by the reduction in credit from the merged bank as firms in other loan quintiles, however only firms in the highest loan quintile were able to offset the reduction in credit by lending from alternative sources. It is interesting to note that small and medium sized firms were not able to offset the reduction in credit availability even if they had multiple lending relationships before the merger. This suggests that adverse selection affected the capacity of small and medium sized firms to get credit even from pre existing bank relationships.

In table 1.8, I present the reduction in the availability of credit by the length of the bank lending relationship with the acquirer.¹¹ I find that firms having long relationships with the acquirer experience a larger reduction in the availability of credit as a result of a decrease in the number of bank lending relationships than firms having a relatively new bank lending relationship with the acquirer. This effect holds for firms in all loan quintiles, however it is only statistically significant for firms in the first loan quintile. This difference is also significant in the aggregated, but only at the 10% level. One explanation for this finding is that the merged bank implemented a larger reduction in the access to credit for clients having a long term relationships with the acquirer. To test this explanation, I study the reduction in the size of the loan that firms received from the merged bank (see table 1.13). We observe that contrary to the results in table 1.8, the difference in the length of the banking relationship with the acquirer does not affect the magnitude of the reduction in the loan size for firms in the second, third, fourth and fifth loan quintile. This suggests that the difference in the magnitude of the reduction in credit availability observed across different loan quintile categories is not explained by a higher reduction in the lending from the merging bank. A potential explanation for the aforementioned difference can be that a longer relationship with the acquirer exacerbates the hold up problems, and makes it more costly to get loans from alternative sources.

In table 1.9, I present the change in default rate for firms whose number of bank lending relationships were reduced from 2 to 1 as a consequence of the merger. Overall the default rate for these firms is 1.26% larger compared to similar firms unaffected by the merger. This finding supports the prediction in Bolton and Scharfstein (1996), according to this model a reduction in the

¹¹Given data limitations, I divide the sample into two groups: (1) firms having a bank lending relationship with the acquirer greater than or equal to two years and (2) firms having a bank lending relationship with the acquirer for less than two years

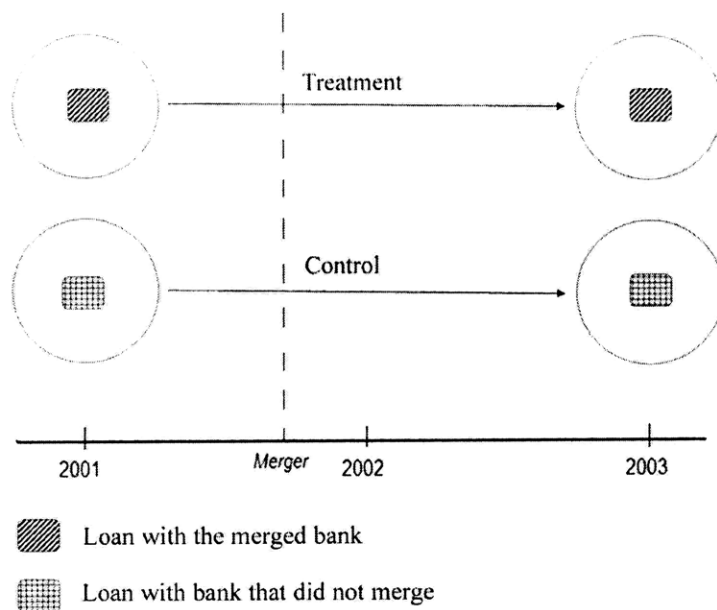
number of lender will make it easier for the firms to renegotiate the terms of its debt. The positive effect on renegotiation can have to negative effects on the incentives of the firm's management. First, knowing the cost of renegotiation will be lower they may decide to engage in more risky projects, second even if they engage in efficient projects they may decide to strategically default on the loan to improve the terms of the loan contract. The findings in table 1.9 support only the later mechanism. If firms were risk shifting in their investment decision we should observe higher default rates that are persistent in time. However I find that the increase in default rate is transient and disappears four year after the merger. The effect on default rates being transient could be better understood if it is driven by strategic default. Firm could decide to strategically default on the loan just after the merger to improve the terms of the loan contract, however after the terms are renegotiated the firms should not show higher default rates compared with similar firms unaffected by the merger. We also observe in table 1.9 that firms in loan quintiles 1 and 2 do not show an increase in default rate, furthermore firms in the second loan quintile show a decrease in the default rate. There are two potential explanation for this finding. First these firms may be benefited from a more concentrated lending. According to Rajan (1992) model and in lines with the result in Petersen and Rajan (1994) small firms have lower default rates when they engage in relational lending usually associated to single lending. A second explanation also supported by Rajan (1992) is that small firms engaging in relational lending will be closely monitored by the bank and therefore it will be difficult for them to engage in strategic default.

1.6 Robustness Checks

A principal concern with the methodology I used in my results section is that the observed results could be driven by changes in the lending policy of the merged banks. To address this concern, I study whether the findings in the quasi-experiment analysis are also observed in firms that had a single bank lending relationship with one of the banks that merged. For these firms, their number of lending banks was unaffected by the merger, but they would have been exposed to the merged bank policy changes.

Figure 2 displays information regarding the control and treatment groups for the robustness check estimation. We can see that all the firms included in this estimation have one bank lending relationship before and after the treatment and thus none of these firms experienced a change in their number of banking relationships. However, firms in the treatment group are affected by

Figure 2: Robustness Check: Treatment and Control Groups



potential changes in the policy of the merged bank, while firms in the control group are not affected by a change in the policy of the merged bank, because they do not have a lending relationship with the bank.

I perform a difference-in-difference analysis for the group of firms having a single lending relationship with the merged banks, relative to a comparison group of firms that had a single bank lending relationship with a bank that did not merge. If my findings in the quasi-experiment were driven by changes in the lending policy of the merged bank, the findings should still hold in the estimation for firms with single bank relationships. In tables 1.10, 1.11 and 1.12, I present the results of this robustness check estimation. In table 1.10, I present the analysis for the probability of adding a new bank lending relationship. In table 1.11, I display my analysis for the total loan amount. Lastly, in table 1.12, I present my analysis for the change in default rates.

In table 1.10, I present the difference in the probability of adding a new bank lending relationship after the merger between firms that borrowed from only one of the merging banks compared to firms that borrowed from a single bank that did not merge. We observe that in average firms that were borrowing from only one of the merging banks have a lower probability of adding a new bank lending relationship than firms which were borrowing from a single bank that did not merge. This is not too surprising since firms borrowing from one of the banks that merged probably got access

to some new services after the merger (provided by the merged banks from which the firms was not borrowing).

In table 1.11, I present the estimation for the change in the outstanding loan before and after the merger. We observe that the change in total loan amount for clients holding loans with either the acquirer or the target (third column) is five times smaller than the effect for clients holding loans with both the target and the acquirer (fourth column), 2.95% compared to 14.35. However, there is important variation across quintiles. Firms in the first loan size quintile increase their total outstanding loans in 4.44%. On the contrary, firms with loans in the third loan size quintile have a reduction in their total outstanding loans of 8.43%. This high fluctuations casts some concerns regarding the interpretation of the results for this variable in the quasi-experiment. However, even the maximum observed reduction in the total loan amount for firms with single bank relationships (8.43% for firms in the third quintile) is still less than 50% the effect in the quasi-experiment.

It is also interesting to note in table 1.11 that clients holding loans only with the target experience a significant increase in their total loan amount while clients holding loans only with the target experience a significant decrease in their total loan amount. This result suggest that some information is lost for clients with loans in the target (as some of the loan officers in the target were fired after the merger), however this hypothesis cannot be fully identified given data limitation. Another interesting result is that the biggest reduction in total loan amount is experienced by clients having bank relationships with both the acquirer and the target bank who hold most of their debt with the acquirer, because this clients should be well known by the acquirer loan officers (who were not fired) we cannot explain this reduction by an information problem, therefore this finding suggest that it is the reduction in the total loan amount is explained by the reduction in the number of lending banks.

In table 1.12, I present the change in default rates for firms holding single lending relations with the banks that merged. We see that at the aggregated level, the default rate for firms who borrow from the merged banks decreases 0.81% after the merger. On the contrary, in the quasi experiment we observed an increase in the default rates.

In short, this robustness checks provides grounds for confidence that the results of the quasi-experiment are due to an exogenous change in the number of bank relationships and not the result of changed post-merger lending policy.

1.7 Conclusion

This chapter examines how the number of lenders used by firms affects their access to funds, by means of a quasi-experiment generated by the merger of two major banks in Chile in 2002. This merger exogenously reduced the number of bank lenders for some firms in Chile and this exogenous shock is used to address the potential endogeneity, self selection and unobservable variables biases in previous empirical work.

In a frictionless financial market such as the one described in Modigliani and Miller (1958), firms are indifferent with respect to the number of bank lending relationships they have. However, in a market with asymmetric information, commitment problems or transaction costs the number of bank relationships it has can affect the firm's ability to raise funds and its incentives to exert effort and repay the loan (see for example: Rajan (1992), Bolton and Scharfstein (1996) and Thakor (1996))

This chapter provides evidence that, contrary to what would happen in a frictionless market, companies appear to have a target for the number of banks from which they borrow: firms whose number of banking partners was reduced by the merger were about 19% more likely to add a new bank lending relationship compared to similar firms unaffected by the merger.¹²

To distinguish between different theories that explain this finding, I examine the effect of the number of bank lending relationships on the firm's total debt outstanding.

I find that firms which went from having two to one bank lending relationships as a result of the merger experienced on average a 15% reduction in the total loan size, compared to similar firms unaffected by the merger.

These findings are consistent with the model in Bolton and Scharfstein (1996) in that the outstanding loan decreases and the default rate increases after a reduction in the number of bank lenders. However, the predictions in Rajan (1992) are not observed in the aggregate results, although for firms with loans in the lowest loan quintile, we do observe evidence supporting Rajan's predictions. A potential explanation is that the asymmetric information problem that explains the benefit of informed lending in Rajan is more relevant for smaller firms, where hard information about the firm is less likely to be available for the bank.

The observed reduction in the total outstanding loan amount is also consistent with the model in Thakor (1996) in that the outstanding loan amount falls after a reduction in the number of

¹²Defined as the probability of increasing the number of banking partners in the five years following the merger

lenders. An alternative explanation for the reduction in loan size, not explored in the literature, is that agency problems between the bank and the loan officers generate incentives for the loan officers to over-diversify compared with what is optimal for the bank. This may happen if each loan officer's wage is linked to the default rate of his own portfolio, which is a small fraction of the bank's portfolio. Further theoretical research is needed to explore this alternative explanation.

Important questions remain unanswered and provide avenues for future research. For example, due to data limitations this study does not explore the effect of the number of lenders on the price of the loan, which would help understand the motivations of firms in choosing the number of bank lending relationships. It would also be of interest to consider whether a reduction in the number of bank lending relationships has any effect on the sales, profits, costs and productivity of firms. However, this would require more detailed information on firms than is currently available.

Appendix

Table 1.1: Summary Statistics Before the Merger

In this table I present summary statistics for the treatment and control groups. All the firms in both groups have two bank lending relationships. The firms in the treatment group have lending relationships with the acquirer and with the acquired banks while the firms in the control have lending relationships with the acquirer and with a bank that did not merge. The debt presented in this table is the sum of the loans in each of the lending banks and I present the standard deviations in parentheses. The default rate was calculated as the fraction of firms having past due payments of 90 days or more at the end of 2001, but I excluded from the calculation the firms that were already in default at the end of 1999. The probability of leaving financial distress was calculated as the fraction of firms without past due payments of 90 days or more at the end of 2001. Only firms in default, at the end of 1999, were used in this estimation.

variable	Treatment	Control
General Variables		
number of firms	5648	9897
loan mean	55423 (1013205)	29665 (261675)
loan p25	2889	1849
loan median	6212	3815
loan p75	13946	8187
default rate	7.37	8.85
prob. Leave def.	35.32	34.62
Variables by quintile		
Number of firms		
quintile 1	1128	3272
quintile 2	1130	2373
quintile 3	1130	1754
quintile 4	1130	1311
quintile 5	1130	1187
Loan mean		
quintile 1	1265 (646)	1333 (609)
quintile 2	3460 (655)	3396 (656)
quintile 3	6293 (1001)	6173 (1004)
quintile 4	11956 (2947)	11681 (2778)
quintile 5	254047 (2255061)	214851 (729551)
Default rate		
quintile 1	6.21	8.01
quintile 2	8.23	9.69
quintile 3	7.43	9.92
quintile 4	8.32	9.92
quintile 5	6.64	6.74
Probability of leaving financial distress		
quintile 1	39.13	33.18
quintile 2	48.94	38.85
quintile 3	27.66	35.42
quintile 4	23.4	28.33
quintile 5	37.5	35.09

Table 1.2: Summary Statistics After the Merger

In this table I present summary statistics for the treatment and control groups. All the firms in both groups have two bank lending relationships. The firms in the treatment group have lending relationships with the acquirer and with the acquired banks while the firms in the control have lending relationships with the acquirer and with a bank that did not merge. The debt presented in this table is the sum of the loans in each of the lending banks and I present the standard deviations in parentheses. The default rate was calculated as the fraction of firms having past due payments of 90 days or more at the end of 2003, but I excluded from the calculation the firms that were already in default at the end of 2001. The probability of leaving financial distress was calculated as the fraction of firms without past due payments of 90 days or more at the end of 2003. Only firms in default, at the end of 2001, were used in this estimation.

variable	Treatment	Control
General Variables		
number of firms	5780	12131
loan mean	45672 (597505)	23182 (285356)
loan p25	2804	1609
loan median	6470	3348
loan p75	15900	7105
default rate	10.69	10.82
prob. Leave def.	34.69	37.18
Variables by quintile		
Number of firms		
quintile 1	1155	4291
quintile 2	1156	3278
quintile 3	1156	2149
quintile 4	1156	1249
quintile 5	1157	1164
Loan mean		
quintile 1	1107 (639)	1198 (589)
quintile 2	3433 (731)	3327 (719)
quintile 3	6562 (1159)	6421 (1159)
quintile 4	13374 (3295)	13022 (3239)
quintile 5	203708 (1324161)	201982 (902082)
Default rate		
quintile 1	6.84	8.58
quintile 2	10.21	13.24
quintile 3	11.68	12.19
quintile 4	12.98	11.05
quintile 5	11.75	9.54
Probability of leaving financial distress		
quintile 1	35.42	39.23
quintile 2	30.61	40.09
quintile 3	40.82	35.87
quintile 4	26.53	28.36
quintile 5	40	30.43

Table 1.3: Increase in probability of adding a bank lending relationship after an exogenous reduction in the number of bank lenders

In this table, I study whether an exogenous reduction to the number of lending relationships increases the likelihood that the firm adds a new bank lending relationship. The estimation is evaluated as the probability that a firm whose number of lending relationships was reduced by the merger adds a new bank lending relationship compared to the probability that a similar firm that was unaffected by the merger adds a new bank lending relationship. The results are presented by the number of banks that the firms had pre-merger. Each row presents the probability that a firm that had N banks before the merger (and therefore N-1 after the merger) adds a new bank lending relationship after the merger, compared to similar firms that were unaffected by the merger. The last row presents the average estimated using equal weights for firms having two, three and four banks pre-merger. The different columns present the probability of adding a new bank lending relationships for different time frames (one, two, three, four and five years after the merger).

quintile	P(1 st year)	P(2 nd year)	P(3 rd year)	P(4 th year)	P(5 th year)
Two banks	6.38*** (0.69)	14.53*** (0.8)	19.28*** (0.82)	21.81*** (0.83)	23.23*** (0.84)
Three banks	6.87*** (0.59)	12.3*** (0.65)	17.07*** (0.68)	18.33*** (0.67)	18.83*** (0.68)
Four banks	6.85*** (0.71)	9.86*** (0.77)	13.21*** (0.78)	14.25*** (0.75)	14.06*** (0.77)
average	6.7*** (0.38)	12.23*** (0.43)	16.52*** (0.44)	18.13*** (0.43)	18.71*** (0.44)

Table 1.3.b: Estimation example for table 1.3

Number of banks	group of firms	P(new bank) 2 years	P(new bank) 5 years
Two banks	affected by merger	34.08	44.86
Two banks	unaffected by merger	19.55	21.63
Difference		14.53	23.23

Table 1.4: Increase in probability of adding a bank lending relationship after an exogenous reduction in the number of bank lenders

In this table, I study whether an exogenous reduction to the number of lending relationships increases the likelihood that the firm adds a new bank lending relationship. The estimation is evaluated as the probability that a firm whose number of lending relationships was reduced by the merger adds a new bank lending relationship compared to the probability that a similar firm that was unaffected by the merger adds a new bank lending relationship. The results are presented for each category of debt (divided by quintiles according to the total loan amount). The aggregated effect is presented in the last row “aggregated” and is evaluated using a simple matching estimation with equal weights for each loan quintile.

quintile	P(1 st year)	P(2 nd year)	P(3 rd year)	P(4 th year)	P(5 th year)
quintile 1	5.33*** (0.77)	8.59*** (0.87)	13.67*** (0.93)	15.5*** (0.93)	16.41*** (0.95)
quintile 2	4.37*** (0.8)	11.34*** (0.93)	16.11*** (0.97)	16.67*** (0.96)	16.58*** (0.98)
quintile 3	4.4*** (0.86)	8.53*** (0.96)	14.03*** (1.01)	16.45*** (1)	16.51*** (1.02)
quintile 4	4.98*** (0.96)	8.9*** (1.08)	11.03*** (1.11)	14.58*** (1.09)	17.17*** (1.12)
quintile 5	8.25*** (1.06)	14.61*** (1.2)	18.51*** (1.21)	17.4*** (1.21)	17.09*** (1.22)
aggregated	5.47*** (0.4)	10.39*** (0.45)	14.67*** (0.47)	16.12*** (0.47)	16.75*** (0.48)

Table 1.5: Reduction in total debt outstanding for firms reducing their number of bank lending relations from two to one

In this table, I present the reduction in the total value of the outstanding loans generated by a reduction in the number of lending relations. Each reported coefficient is the outcome of a difference in difference estimation. The first difference is the average loan size increase over a period of two years (since the merger) for firms that reduced their lending relations from two to one, as a consequence of the merger, minus the average loan size increase of similar firms that were not affected by the merger. To control for any pre-existing differences, I subtract the difference in loan increase (over a period of two years) that the two groups had right before the merger. The difference in the total debt outstanding is presented two, three and four years after the merger to test whether the effect is persistent over time. The results are presented for each category of debt (divided in quintiles according to loan size). The aggregated effect is presented in row ALL and is evaluated using a simple matching estimation with equal weights for each loan quintile. In table 1.5.b, I present an example of the calculations used to estimate table 1.5.

quintile	effect after two years	effect after three years	effect after four years
quintile 1	-1.16 (5.38)	3.09 (5.41)	0.62 (5.43)
quintile 2	-21.52*** (4.99)	-20.38*** (5.25)	-24.15*** (5.43)
quintile 3	-19.11*** (4.63)	-20.16*** (5.07)	-21.4*** (5.37)
quintile 4	-16.6*** (4.78)	-23.8*** (5.23)	-23.47*** (5.64)
quintile 5	-13.38*** (4.29)	-14.57*** (4.78)	-11.56** (5.23)
ALL	-14.35*** (2.29)	-15.16*** (2.44)	-15.99*** (2.54)
N treatment	4817	4526	4286
N control	10126	9464	8897

Table 1.5.b: Estimation example for table 1.5

quintile	change before merger	change after merger	difference in difference
ALL	39.05	34.6	
ALL	37.72	51.25	
First Difference	1.33	-16.65	-14.35

Table 1.6: Reduction in outstanding loans from the original lenders

In this table, I redo the estimation in table 1.5 excluding the loans that firms got from new bank lending relationships.

quintile	effect after two years	effect after three years	effect after four years
quintile 1	-7.16 (5.64)	-7.76 (5.96)	-17.57*** (6.15)
quintile 2	-23.89*** (4.78)	-27.54*** (5.18)	-36.06*** (5.54)
quintile 3	-26.51*** (4.25)	-30.77*** (4.7)	-35.34*** (5.05)
quintile 4	-23.13*** (4.47)	-32.39*** (4.87)	-36.01*** (5.26)
quintile 5	-22.59*** (3.85)	-25.31*** (4.24)	-27.86*** (4.66)
ALL	-20.65*** (2.19)	-24.75*** (2.36)	-30.57*** (2.5)
N treatment	4817	4526	4286
N control	10126	9464	8897

Table 1.7: Reduction in outstanding loans for firms with 3 or more bank lending relationships pre merger

In this table, I repeat the estimations in table 1.5 considering firms that had 3 or more bank lending relationships before the merger. The purpose of this table is to evaluate to which extent having an alternative source of funding other than the merging bank helps to offset the reduction in lending from the merging banks.

quintile	effect after two years	effect after three years	effect after four years
1	-5.79 (5.47)	-4.26 (5.71)	-5.45 (5.87)
2	-18.94*** (4.59)	-18.13*** (5.14)	-24.54*** (5.48)
3	-11.4*** (4.24)	-10.01** (4.81)	-14.59*** (5.26)
4	-15.1*** (4.5)	-17.05*** (5.06)	-23.88*** (5.59)
5	-0.39 (4.32)	-3.05 (4.93)	-2.06 (5.45)
ALL	-10.32*** (2.14)	-10.5*** (2.37)	-14.1*** (2.53)
N target	3699	3389	3208
N mock target	8050	7387	6918

Table 1.8: Reduction in total debt outstanding for firms reducing their number of bank lending relations from two to one by length of relationship with the acquirer.

In this table, I present the effect of a reduction in the number of lenders on the firm's total loan amount. I divide the sample into firms that had a bank lending relationship of more than 2 years with the acquirer and firms that had a relationship of less than two years with the acquirer. Each row presents the estimation for a different loan category (divided by quintiles according to the loan size). In the last row I present the aggregated effect evaluated using a matching estimation with equal weights for each loan quintile. In column one I present the effect of a reduction in the number of lenders on the total loan amount of firms that had a lending relationship of less than two years with the acquirer. In column 2 I present the effect of a reduction in the number of lenders on the total loan amount of firms that had a lending relationship of more than two years with the acquirer. Finally in column three I present the difference between the effect for firms with long relationships with the acquirer and firms with short relationships with the acquirer .

quintile	less than two year relationship	more than two year relationship	Δ
quintile 1	8.17 (6.92)	-7.9 (6.24)	16.07* (9.32)
quintile 2	-16.69** (7.07)	-23.87*** (5.52)	7.18 (8.97)
quintile 3	-17.33*** (6.46)	-20.04*** (5.12)	2.71 (8.25)
quintile 4	-14.93** (7.29)	-17.05*** (5.21)	2.12 (8.96)
quintile 5	-8.48 (7.34)	-14.89*** (4.49)	6.42 (8.61)
ALL	-9.85*** (3.14)	-16.75*** (2.39)	6.9* (3.95)
N target	1509		3308
N mock target	3467		6659

Table 1.9: Increase in default rate for firms reducing their number of bank lending relations from two to one

In this table I estimate the change in default rate spurred by a reduction in the number of lending relations. Each reported coefficient is the outcome of a difference in difference estimation. The first difference averages the default rate of firms that reduced their lending relations from two to one, as a consequence of the merger, minus the average default rate of similar firms that were not affected by the merger. To control for any pre-existing differences, I subtract the difference in the variables that the two groups had immediately preceding the merger. The estimation is presented for two, three and four years after the merger to test whether the effect is persistent over time. The results are presented for each category of debt (divided in quintiles according to loan size). The aggregated effect is presented in row ALL and is evaluated using a simple matching estimation with equal weights for each loan quintile. In table 1.9.b, I present an example of the calculations used to estimate table 1.9.

quintile	effect after two years	effect after three years	effect after four years
quintile 1	0.07 (1.22)	0.43 (1.28)	-0.56 (1.28)
quintile 2	-1.57 (1.48)	-2.21 (1.51)	-2.73* (1.56)
quintile 3	1.97 (1.58)	0.63 (1.65)	1.42 (1.7)
quintile 4	3.52** (1.77)	1.75 (1.86)	0.72 (1.91)
quintile 5	2.32 (1.65)	2.16 (1.75)	2.08 (1.74)
All	1.26* (0.69)	0.55 (0.73)	0.19 (0.74)
N treatment	5780	5780	5780
N control	12131	12131	12131

Table 1.9.b: Estimation Example for Table 1.9

group	quintile	default before merger	default after merger	dif in dif
treatment	ALL	7.37	10.69	
control	ALL	8.85	10.82	
First Difference		-1.49	-0.13	1.26

Table 1.10: Change in the probability of adding a new bank lending relationship for firms having a single bank lending relationship.

In this table I present the difference in the probability of adding a new bank lending relationship after the merger between firms that borrowed from only one of the merging banks compared to firms that borrowed from a single bank that did not merge.

quintile	P(1 st year)	P(2 nd year)	P(3 rd year)	P(4 th year)	P(5 th year)
quintile 1	-3.33*** (0.24)	-3.04*** (0.29)	-3.38*** (0.3)	-3.8*** (0.31)	-3.04*** (0.32)
quintile 2	-3*** (0.5)	-2.94*** (0.58)	-3.56*** (0.61)	-3.39*** (0.61)	-2.18*** (0.62)
quintile 3	-1.58** (0.64)	-0.8 (0.75)	-1.02 (0.79)	-2.12*** (0.8)	-0.99 (0.81)
quintile 4	-0.34 (0.68)	1.7** (0.8)	1.76** (0.84)	1.13 (0.86)	1.18 (0.88)
quintile 5	-0.58 (0.6)	2.75*** (0.69)	3.1*** (0.73)	2.75*** (0.75)	2.09*** (0.77)
aggregated	-1.77*** (0.25)	-0.47 (0.29)	-0.62** (0.31)	-1.08*** (0.31)	-0.59* (0.32)

Table 1.11: Effect of the merger on outstanding loans for firms holding one bank lending relation

This table is similar to table 1.5 because it evaluates the increase in outstanding loans as a result of the merger. However, unlike table five where clients have two or more bank lending relationships, one of which is held with the acquired bank, table 11 evaluates firms that have only one bank relationship. To further understand the effect of the merger on the total loan amount of firms, I also present the effect of the merger on the loan size of firms that have most of their debt with the acquirer bank (more than 50%). This table aims to identify potential changes in the policy of the merged bank.

quintile	acquirer	target	either	both	mainly acquirer
quintile 1	18.86*** (1.18)	-9.98*** (1.36)	4.44*** (0.9)	-1.16 (5.38)	-11.23 (8.42)
quintile 2	9.11*** (1.81)	-15.05*** (1.86)	2.97** (1.3)	-21.52*** (4.99)	-21.99*** (7.4)
quintile 3	-0.79 (2.11)	-16.88*** (2.04)	-8.83*** (1.47)	-19.11*** (4.63)	-19.57*** (6.92)
quintile 4	0.3 (2.6)	-15.09*** (2.11)	-7.4*** (1.67)	-16.6*** (4.78)	-27.52*** (7.11)
quintile 5	7.42*** (2.16)	-7.39*** (1.49)	0.01 (1.31)	-13.38*** (4.29)	-18.76*** (6.45)
ALL	6.98*** (0.87)	-12.88*** (0.87)	-2.95*** (0.62)	-14.35*** (2.29)	-19.81*** (3.45)

Table 1.12: Effect of the merger on the default rates of firms holding one bank lending relationship

In this table I replicate the analysis from table nine, using firms that have only one bank relationship and therefore do not have overlapped banks. Similarly to table nine, the first group consists of firms holding bank lending relations with the acquirer, or the acquired bank, while the second group consists of firms holding relations with banks did not merge. This table provides evidence to identify potential changes in the policy of the merged bank.

quintile	Change in default rates
quintile 1	-0.19 (0.21)
quintile 2	-0.82* (0.44)
quintile 3	-0.75 (0.58)
quintile 4	-1.31* (0.68)
quintile 5	-0.98** (0.49)
ALL	-0.81*** (0.17)
N merged	107975
N other banks	72975

Table 1.13: Reduction in the size of the loan received from the merged bank. Effect for firms having 3 or more bank relationships before the merger.

In this table, I study the reduction in the loan size received from the the merged bank by firms having 3 or more bank lending relationships before the merger, and whose number of bank lending relationships were reduced as a consequence of the merger.

quintile	effect after two years	effect after three years	effect after four years
quintile 1	-18.87*** (5.83)	-30.62*** (6.32)	-39.18*** (6.51)
quintile 2	-24.96*** (5.29)	-35.92*** (5.87)	-46.2*** (6.17)
quintile 3	-28.19*** (5)	-29.63*** (5.49)	-39.69*** (5.95)
quintile 4	-32.61*** (5.27)	-34.97*** (5.79)	-44.12*** (6.28)
quintile 5	-28.06*** (4.8)	-30.38*** (5.34)	-37.33*** (5.87)
ALL	-26.54*** (2.36)	-32.3*** (2.59)	-41.31*** (2.75)
N target	3699	3389	3208
N mock target	8050	7387	6918

Chapter 2

Financial Literacy and Firm Performance, Evidence from a Field Experiment

2.1 Introduction

Is financial education beneficial for micro-entrepreneurs? Many micro-finance institutions condition their lending on participation in micro-finance training programs. Other financial institutions offer optional training, at no charge or at a reduced price. Institutions requiring training or offering subsidized training believe that training will improve their clients' economic prospects and subsequently their own profitability. But, is that belief true? There are still an important number of micro-credit institutions that do not offer training, and there is no evidence that their clients do worse than those of institutions who provide training. There are several problems that complicate the evaluation of the effectiveness of these financial training programs. First, financial institutions that offer training are different from financial institutions that do not offer such programs. Second, training programs differ significantly among institutions offering training and, third, clients that choose to enroll in training programs are usually different from the ones that do not get training.

In this study, we overcome these difficulties by conducting a randomized impact evaluation of a training program for micro-entrepreneurs in the Dominican Republic. In our experiment, we offered training to a randomly selected group of clients. To better understand the mechanism through which financial training operates we also randomized the type of training that clients were offered and access to on-site advice. We randomly offered two types of training: 1) accounting training, comprising income and expenses accounting modules, inventory management and profit calculation and 2) cash-management training consisting of basic techniques to help clients separate business accounts from household accounts. The accounting training was more complex and time consuming; it consisted of learning how to keep track of all the sales and expenditures of the business and of how to use this information to estimate business profits. This training allowed the client to obtain a more comprehensive understanding of the results of the business. On the other hand, the

cash management training program was simpler and less time consuming and consisted of learning how to keep separate accounts for the business and the household and how to make a raw estimation of the profits by comparing available cash at the beginning and the end of the month. Finally we also provided on-site advice to a randomly-selected group of the clients within the larger population of all enrolled participants. The purpose of the on-site advice was to foster the implementation of the newly-acquired skills in the operations of the business.

The combination of these different treatments makes it possible to observe the benefits of a micro-finance training program and the mechanisms through which training affects the clients. The main findings of the paper are that the probability of improving the accounting practices among people who were offered cash flow management training was 10% higher than the same probability for a control group that was not offered training. People who were offered cash flow management training also showed a significant increase in their average sales, and in the level of sales, during bad times. This last finding suggests that one of the mechanisms through which training affects clients is by acting as a buffer to negative shocks experienced by business. On-site advice did not affect the probability of keeping separate accounts and did not increase sales among people who received cash management training, suggesting that on-site advice is not necessary when the training is simple and can be quickly implemented. On the other hand, people who were offered accounting training did not show a significant increase in the probability of improving their accounting practices compared to a control group who was not offered training. Consistent with the last finding, these entrepreneurs did not show an increase in their sales compared to a control group who was not offered training.

The sample for the experiment consisted of 1200 entrepreneurs who were randomly drawn from a pool of more than 50,000 clients of ADOPEM (Dominican Association for the Development of Women), a private bank that lends money to small businesses in the Dominican Republic. The bank, which started out as an NGO that supported low-income women, recently became a private bank and now includes men in their client pool. Among the 1200 clients selected for the experiment, 400 were offered accounting training, 400 were offered cash management training, and 400 were assigned to the control group. The basic accounting training consisted of 6 classes and the cash management training consisted of 5 classes. The first three classes contained identical modules for both groups and included: i) control of consumption (taught clients to adjust their consumption to their income and to avoid unnecessary consumption), ii) savings (taught clients the relevance of saving and the different motivations they should consider when calculating their savings needs) and iii) debt management (taught how to estimate their credit needs and how to organize their cash flows in order to avoid missing payments). The basic accounting training included 3 additional modules that focused on the accounting of sales and costs and profit evaluation. The cash management training included 2 additional modules that focused on how to keep the accounts and the cash flows of the business separate from the accounts and cash flows of the household. Both training programs included booklets especially designed to help the clients implement the newly-acquired skills in their businesses.

The on-site advice consisted in weekly visits by trained personnel who ensured that the newly-learned skills were being properly implemented in the business. When necessary, advisors reviewed the class materials with the entrepreneurs and helped clarify any doubts the entrepreneurs might have had. The on-site advice was applied to a randomly-selected fraction of the trained entrepreneurs; additionally, the on-site advice was also applied to a fraction of the clients in the control group in order to test whether periodic visits to the clients had any effect on their performance in the absence of training.

To measure the effect of the different treatments we conducted thorough surveys before and after the treatment. The survey was given to both the treatment and the control groups and it contained exhaustive questions concerning: i) personal characteristics, ii) characteristics of the business, iii) savings practices, iv) consumption practices, v) investment, vi) sales, vii) costs and expenditures, and viii) credit-related practices. The survey was carried out by an independent party (Gallup Dominican Republic).

The rest of the paper is organized as follows. In section 2, we present a brief description of the related literature and in section 3 we present a detailed description of the experiment. Section 4 presents summary statistics of the sample, section 5 presents the results and in section 6 we conclude.

2.2 Related Literature

Karlan and Valdivia (2006) study whether entrepreneurship can be taught to micro entrepreneurs. They evaluate the marginal impact of adding entrepreneurship training to micro entrepreneurs in Peru by randomly assigning training to some entrepreneurs. Their study is similar to this project in that it measures the effect of training by randomizing the access to training and conducting exhaustive baseline and a follow up survey to the clients participating in the experiment. Karlan and Valdivia (2006) find strong benefits for both the client and the micro finance institution. The client shows improvements in their knowledge, business practices and sales while the micro finance institution benefited from increased retention and repayment.

Our study is different from Karlan and Valdivia (2006) in two ways: First It randomized the type of training, making it possible to understand which skills are more relevant to improve the performance of entrepreneurs. Second our study also randomizes the access to on-site advice, which helps to distinguish the effect of adding knowledge to entrepreneurs from the effect of implementing the new skills in the business.

On other related research Lusardi (2008) shows widespread financial illiteracy among the US population, specially among; people with low education, women, African American and Hispanic. Lusardi also shows that financial illiteracy can lead to poor financial decision making, in particular regarding retirement planing, borrowing decision and investment decision. In related work Lusardi and Mitchell (2007) show that households are unfamiliar even with the most basic financial concepts to make savings and investment decisions. In the Lusardi (2008) and Lusardi and Mitchell (2007) framework, financial education training will lead individuals to improve their borrowing, savings and investments decisions. However the effect of financial illiteracy on the performance of entrepreneurial activity is not addressed in their study. In our

study we evaluate how financial training affect the organization and performance of businesses.

2.3 Methodology and Description of the Experiment

The experiment was designed as a randomized trial to determine the effects of expanding financial literacy on beneficiaries outcomes. In particular, the objective of the evaluation is to determine whether providing this type of training to ADOPEM's clients in addition to a loan promotes positive results above and beyond a simple line of credit to low-income entrepreneurs.

A sample of 1,200 participants was randomly drawn from a pool of ADOPEM's more than 50,000 clients. Participants were subsequently randomly assigned to a treatment group-those to receive invitation to get the training and a control group-those without the opportunity to receive training-about 800 and 400 people respectively ¹. A baseline survey of all participants was carried out in November 2006 by the branch of Gallup in Dominican Republic, in order to create a basis for comparison. We also conducted a follow up survey at the end of year 2008.

Because participation in these courses was voluntary, the implementation of this program required an extensive outreach campaign. In order to maximize attendance and manage the implementation, the program was divided into two waves. In the first wave (March-May, 2007), 302 individuals from the treatment group were invited, of which 130 received treatment; in the second wave (July-August, 2007), we invited 712 people in the treatment group and of those we treated 239 additional ADOPEM clients.

The training consisted in two different Education Programs: Basic Accounting (BA) and Cash Flow Management (CFM). The two courses share the three initial basic modules-Control of Consumption, Savings and Debt Management. Basic Accounting includes 3 additional classes that focus on costs, sales and profit calculations and salary determination; while Accounts Separation includes 2 classes that train participants on how to separate business from household accounts and cash flows. Individuals randomly assigned to the treatment group underwent an additional randomization that determined into which of the two groups they were assigned.

The motivation behind randomly assigning people to two distinct training treatments was to test how each of these didactic programs affects participants and whether one of them is most effective at achieving economic improvements than the other. In particular we wanted to test whether a very easy to teach skill, separating the cash of the business from the cash of the household resulted in an improvement of the business results. The reason to test that program is that with complicated programs it is difficult to distinguish lack of implementation of the new skill into the business from lack of knowledge.

In addition to the training itself, we included other follow-up type treatments to foment the long-term use of the newly acquired skills. To this end, we offered follow-up visits to randomly chosen subsets both within the two treatment groups (BA and CFM) and the control group. The purpose of these visits was to

¹Due to implementation issues the total sample ended up being 1,198 participants of which 809 were in the treatment group and 389 in the control group.

make sure that the followed clients implemented the new skills into the businesses, thus letting us identify the effect of implementing accounting skills versus the effect of just learning new skills.

Classes

Both courses, Basic Accounting (BA) and Cash Flow Management (CFM) share the three initial basic modules that offer an introduction to financial issues. In these three initial classes, participants learn about basic and non-basic consumption, strategies to control consumption and increase savings, and debt management. Starting with the fourth week there is a change of focus to either Basic Accounting or Accounts Separation, depending on the assigned course. The Basic Accounting modules teach participants in a very accessible manner how to register and track their sales, expenditures, calculate profits, learn how to keep inventory, and keep track of accounts receivable and payable. The Accounts Separation course focuses on techniques that allow participants to separate their business accounts from their personal-household accounts.

In-Class Materials

All participants who were present in the fourth class received calculators and workbooks: Participants in BA received two workbooks (Sales and Expenditures and Calculating Profits) while those in CFS received only one (Cash Flows between the Business and the Home).

Follow up

The follow up consisted in weekly visits by trained personnel who ensured that the newly-learned skills were being properly implemented in the business. When necessary, advisors reviewed the class materials with the entrepreneurs and helped clarify any doubts the entrepreneurs might have had. The follow up was applied to a randomly-selected fraction of the trained entrepreneurs; additionally, the follow up was also applied to a fraction of the clients in the control group in order to test whether periodic visits to the clients had any effect on their performance in the absence of training.

The idea behind visiting people in the control group is to allow us to separate the impact of in-class training from the additional effect of being visited and encouraged to think about and go over the basic finances of one's business. Since the individuals that receive the dummy follow up do not attend classes at all, having this group permits us to distinguish between the effect of receiving a visit while taking a class and simply being visited without any classes whatsoever.

Venues and Instructors

Venues

Venues were chosen based on their location, quality of facilities, accessibility, and availability. All of the schools we participated with are privately run and the vast majority is affiliated to churches and other religious organizations. This type of schools provided more reliable availability than publicly owned schools.

In order to cover the majority of the city and to provide easy access to participants, in the first round, we partnered up with 7 schools in 6 different sectors of the city, distributed to minimize the participants transportation times.

Scheduling and Participant Allocation to Venues

Both the BA and CFM modules were offered in all participating schools. Courses were offered on different days in each school, depending on the preferences revealed by potential participants during the Gallup surveys carried out prior to the beginning of implementation. In the first round, classes were only offered in the afternoon, from 3:00-6:00pm, while in the second round we offered classes in the afternoon, from 3-6pm, as well as in the morning, from 9:00-12:00pm. Morning classes were only offered in the most populous districts, however. Individuals in the program were given the choice of attending the school of their choice. The vast majority chose the school that was closest to their home.

Instructors

We had a team of 8 instructors in the first wave and a total of 12 instructors in the second wave. The majority of instructors have completed university degrees in various fields like education, accounting, psychology, information technology, among others, and most of them had been working with ADOPEM in other programs. Also, all of the selected instructors have had experience teaching adults and many of them had experience teaching financial education workshops. All of the instructors were Dominican. Throughout both waves we have offered instructors training in the topics covered in classes, didactic techniques and creativity workshops in order to improve their preparation for the training. The evaluations carried out by participants themselves and by the supervisors have been satisfactory for the entire team of instructors. Our instructor evaluation system consisted on weekly and biweekly follow-up meetings, on-site class visits, and evaluation forms and comments from participants. The official performance evaluation in the first wave was the basis upon which we decided the desirability of continuing using the services of each instructor in the second wave; ultimately, our decision was to keep all of the instructors of the first wave for the second wave, with the intention of hiring a few additional instructors. On the week after the last week of classes in both waves we also had feedback meetings with all the instructors in order to receive and record useful information concerning the classes and the materials. As a result of these meetings, several modifications to the instructional materials were effected.

Participants and Attendance

The most significant challenge in both waves was obtaining an adequate level of attendance from participants. Nonetheless, as a result of constant planning and an incessant marketing effort we were able to obtain satisfactory attendance results in the first wave and second waves. The following is a brief analysis regarding attendance levels in the first and second wave. It first looks at overall attendance and subsequently

elaborates on attendance levels in general and subsequently by type of course.

Attendance First Wave

In the first few weeks of the course, attendance was relatively low. However, as classes progressed and more and more courses opened out throughout the city and as the marketing efforts intensified attendance rose substantially. During the first wave, 130 people participated in the courses at least once. This represents 43% of all the people to whom the course was offered (302 people). Of those who participated, 39 people (30%) had perfect attendance; 58 people (45%) were present in 3 or more classes but missed at least one (we consider this having actively participated); and 33 people (25%) were only present in 1 or 2 classes (nonactive participants). This last group was later invited to retake the course during the second wave if they so desired. In total, of the 130 people that participated in the course, 97 individuals (75%) were active participants, having attended 3 or more classes. It is important to note that some groups had a total of six (6) classes (Basic Accounting) while others had five (5) classes (Cash Flow Management).

Of the individuals that participated in the course, 51% of them participated in the Basic Accounting course while, 49% attended the Cash Flow Management. Of the 66 participants in the BA course, 53 or 80% participated in 3 or more classes (active participants), while of the 64 participants in the CFM course, 44 participated in 3 or more classes (69%).

Attendance Second Wave

During the second wave 712 individuals were invited to attend the course. Of these 507 individuals had never been invited before, 172 had been invited to the 1st wave but did not attend, and 33 people had actually participated in the first wave, but only attended 1 or 2 classes and were therefore invited to finish up the course. In the second wave, 239 people participated in the courses at least once. This represents 34% of all the people to whom the course was offered (712 people). Of those who participated, 138 people (58%) had perfect attendance; 56 people (23%) were present in 3 or more classes but missed at least one (we consider this having actively participated); and 45 people (19%) were only present in 1 or 2 classes (nonactive participants). In total, of the 239 people that participated in the course, 194 individuals (81%) were active participants, having attended 3 or more classes.

Of the individuals that participated in the course, 54% of them participated in the Basic Accounting course while, 46% attended the Cash Flow Management course. Of the 129 participants in the BA course, 103 or 80% participated in 3 or more classes, while of the 110 participants in the CFM course, 91 participated in 3 or more classes (83%).

Major Obstacles Hindering Attendance

Throughout our experience in the first and second waves, we have observed that the following factors have been the most significant obstacles to increasing attendance:

- Inaccessibility of venues
- Scheduling conflicts: classes only in the afternoon (no morning classes); this was resolved in the second wave
- Natural causes: rain, death or illness in the family, emergencies, unavailability as a result of work or other obligations

In general, disregarding special cases in which inaccessible venues or other logistical problems hindered attendance, we observed a natural trend of an attendance level that centers around 30% of all the people invited to the course, regardless of what indicator of attendance we use. It is yet to be determined to what extent this trend represents the behavior of ADOPEM's client population. In future more detailed analyses we intend to determine if absenteeism is a result of truly natural causes or if the factors that contribute to low levels of attendance can be eliminated through administrative interventions.

Follow-Up and Follow Uppers

The follow uppers were a group of six people whose main task was to visit individuals from the treatment and control groups to provide them with different types of follow up treatments, as described above. The follow uppers received all of the materials necessary to carry out their tasks, including notebooks, uniforms, and calculators. Before beginning the follow up procedure, all follow uppers were trained for a week and also received the opportunity of going out to the street with the bank's loan officers for a day, in order to get to know the communities in which they would be working. Follow uppers went out to the streets every day, except Saturdays, which were used to have the weekly meetings for the purpose of logging the week's visits. All follow uppers had one assigned day in ADOPEM's Training Center in which they contacted their participants and scheduled their visits for the week. Follow uppers were also responsible of filling out follow up weekly reports.

In general, most participants were very hospitable to our follow uppers and the follow up visits turned out to be very positive experiences for everyone. In many cases, some of the individuals visited actually offered food and drink to the follow uppers. In a minority of cases, however, we did experience some resistance. With regard to visits, there were a few people in the dummy follow up group that were unwilling to receive us after the first visit. This is understandable given the opportunity cost of these peoples time and also the fact that since these individuals have not taken the course they do not understand the practical purpose of visits, much less the experimental purpose thereof. Another interesting situations were those in which ADOPEM's clients no longer had the business they once had owned. We also created special exercises for individuals that fell in this category.

The most significant difficulty we confronted in this process has been finding some of the individuals to be visited especially those in the dummy follow up with whom we have had less contact. The main obstacles

for us have been: incorrect addresses, wrong numbers or out-of-service phones, unavailability, illness and, in one case, even death. In the vast majority of these cases, ADOPEM's client database takes a few weeks and sometimes months to update this contact information, which oftentimes delays our ability to carry out the follow up procedures.

2.4 Data and Summary Statistics

On November and December of 2006, Gallup Dominicana carried out the baseline survey for the ADOPEM-MIT Financial Education Project. The objective of this survey was to gather baseline information that will serve as the initial point of reference to evaluate the impact of the financial education. The survey was administered to all the participant in the experiment (clients in the treatment and in the control group). A total of 1,200 of ADOPEM's clients in the Santo Domingo area. The sample selection excluded clients with housing, consumption and small group loans; it followed a geographical criterion (only clients in the big Santo Domingo area) and was stratified by loan size, loan cycle, and people with and without savings account to ensure enough representation for each of those categories. The results of the survey offer personal, demographic, and socioeconomic information (household and family composition, education and health, consumption and housing, among others), financial information (debt, accounts receivable/payable, alternative sources of income, etc.), and detailed information about the characteristics and operations of the businesses and micro enterprizes owned by clients of ADOPEM.

In this section we present a statistical description of ADOPEM's clients based on the results of the baseline survey. The first section provides detailed information on the personal, demographic, and socioeconomic characteristics of ADOPEM's clients. The second section includes details on clients' financial information and the final section focuses on the characteristics and operations of their businesses. All percentages and values in this document are generalized from the responses of those who were able and willing to respond, unless otherwise stated.

Personal and household information

ADOPEM's clients are primarily women: of those interviewed 90.1% are women, while only 9.9% are men. Their ages range from 18 to 84 years, however, the average age is 40. In fact, 67.2% of all clients are between 30 and 50 years old.

ADOPEM's clients exhibit various arrangements in terms of the composition of the household and the family: the number of people living in the household range from as few as one person (the client) up to 14 people in one home. In the average home, however, there live between 4 and 5 people. In fact, around half of those surveyed live in households with 4 or 5 people. Also, 76% of the clients we interviewed replied that they have a spouse, of which 94.2% live with them; clients that live alone represent only 2.2% of the total

On average, ADOPEM's clients have 3 children and 79.8% of those surveyed said they have between 1

and 4 children; 6.4% have no children and 13.8% reported to have more than 4 offspring. The vast majority of ADOPEM's clients are parents.

Education and Training

In the survey, we also asked the clients about their level of education. Of those who responded, 20.9% claimed to have finished 1-6 years of schooling (primary school); 55.8% said they completed 7-12 years (secondary school) and 20.6% said they completed more than 12 years (university or technical degree). Only 2.7% of the clients said they had not completed any years of schooling.

In general, the clients responses revealed that the average number of years of schooling in the group is 9.31 years. That is, the majority of them finished at least primary school. In fact, 81.9% of clients who responded finished primary school. Also, 67.8% of those surveyed pointed out that they have received technical training of some sort, of which 57.6% said the training was related to their field of work.

Access to Health and Savings for retirement

Only 29.8% of ADOPEM's clients have medical insurance. Of those, 45.7% are themselves policy holders; the rest are listed as dependents on another person's policy. Savings for retirement are very limited between ADOPEM's clients; only 10.8% of those surveyed participate in a pension fund.

70.6% of interviewed clients who answered said they have medical expenses of some kind. For these, the average monthly expenditure is RD\$913.39, which represents 8% of the average monthly earnings of the businesses owned by interviewed clients (RD\$11,375.36). It should be noted that 20.4% of all interviewed people either did not know how or did not want to answer this question. When asked if they had any large medical expenses in the past 12 months, 39% of interviewed clients said yes. The average expenditure of those who revealed their expenditures in this group was RD\$17,949.51 (157.8% of average monthly business earnings). Nonetheless, of those who declared to have large medical expenses in the past 12 months, only the upper quartile had expenditures that exceeded RD\$15,000.00.

Consumption

In order to obtain an idea of what is the level of consumption of ADOPEM's clients, we used two types of questions: questions that determine what type of goods these clients own in their homes (in particular consumer electronics) and questions that directly asked them about their consumption patterns with respect to food and dining. The majority of ADOPEM's clients own a wide range of consumer electronic goods: stove (98.1%), television (96.1%), fan (94.3%), washing machine (93.6%) and refrigerator (92.2%). Among the scarcest electronic goods in these households are microwave ovens (23.1%), video/DVD players (37%) and ovens (44.2%)².

²The survey distinguished between stoves with an oven and stoves without ovens

In response to how many times per month does your family eat out at a restaurant, cafeteria, or picapollo³? 50.2% of those who responded said they never do so. Of those who do eat out with their families, the majority do so 1 to 4 times per month (1 time = 14.3% of total responses; 2 times = 11.3%; 3 times = 5.5%; 4 times = 6.9%). People who go out to eat less than once a month constitute 7.2% of the total, while those who go out more than 4 times per month represent only 4.7%.

Housing

The housing situation of ADOPEM's clients is somewhat mixed. Of those surveyed, the majority (68.7%) own their home. As for the rest, 25.8% rent their home, 2.3% live in a borrowed home and 3.2% live with their parents.

Regarding the declared value of the homes owned by ADOPEM's clients, the value of the median client's home is RD\$500,000.00 (the average value, however, of homes whose value was declared is RD\$913,266.80). The lower quartile lives in homes of less than RD\$200,000.00, while the upper quartile owns homes of more than RD\$1,000,000.00. The percentage of people in the sample that are unaware of the value of their home is 20.3%.

Financial Information

As a result of how the sample for the survey was selected, all clients in the sample had taken a loan from ADOPEM. Of those who answered when asked what type of loan they have, 61% said individual type loan, while the remaining 39% said they have a group type loan where the risk of defaulting on the loans is shared among several borrowers. Moreover, of those interviewed, 76% plan on soliciting another loan from ADOPEM or another bank in the future (12.2% said they wont ask for a new loan and 11.8% dont know). The size of the loan given to the median client at ADOPEM is RD\$20,000.00, which represents 0.4%-2% of the average size of loans disbursed at commercial banks in the Dominican Republic, which ranges between RD\$1,000,000.00 and RD\$5,000,000.00. In fact, according to the Superintendence of Banks of the Dominican Republic, any loan that is less than RD\$100,000.00 is considered a microloan and many commercial banks, such as Scotiabank, do not even offer loans that are less than RD\$30,000.00. At ADOPEM, only the upper quartile has loans that exceed RD\$30,000.00. ADOPEM's clients, on average, pay their loans off in 14 installments, the size of which is RD\$2,385.01, on average. Moreover, 89.4% of ADOPEM's clients that answered said they make enough earnings to service their loans without any problems. The remaining people say they use other sources of income to pay their debt obligations. Only 11.8% of those that answered suggested they have had problems paying ADOPEM back. The most cited reasons why clients are unable to pay off their financial obligations are: insufficient sales (26.8%), health problems (26.3%), and late payment on behalf of their customers (23.1%) (ADOPEM could actually play a role in providing training to its clients on how to keep track and collect payments from their own costumers). ADOPEM's clients

³A picapollo is a ubiquitous type of restaurant in the D.R. that specialize in fried chicken

also use other sources of financing. Of those who answered whether they have other debts besides their ADOPEM loan, 20% said they have taken loans from other banks, while 4.4% borrowed from friends, 5.5% borrowed from family members, 5.9% took loans from informal lenders, and 12.9% buy merchandise on credit.

Savings

65.8% of the interviewed clients said they save one way or another. When asked what is their motivation for saving? the most frequent responses were: for emergencies (27%), for future investments (17%), for their children's education (15.3%), for unforeseen expenses (14.9%) and for old age/retirement (10.7%). People who said they save in order to purchase a home constitute only 6.6% of those who save; for a car (3.6%) and for travelling (2.2%).

In the survey we also asked clients about the institutions where they save and the savings mechanisms they use. 67% of those who answered said they deposit money in a bank. Of those, the median client has RD\$5,831.00 in deposits, while only the upper quartile has savings of RD\$20,000.00 or more in the bank. Also, 56.3% of those who answered as having savings of some sort, said they save in el clavo⁴. Of those who save using el clavo, the median client has RD\$3,000.00 saved using this mechanism and the upper quartile that uses this mechanism has upwards of RD\$8,000.00 stored in this manner. Other clients said they have money saved personally (47.6%) and yet others use the SAN⁵ mechanism (31.9%). Of those who have money saved personally, the median client has RD\$3,000.00 and the upper quartile has RD\$8,000.00 or more saved in this fashion. Of those who use the SAN mechanism, the median client has RD\$5,000.00 saved; the upper quartile has from RD\$10,000.00 and up.

From these observations we can conclude that ADOPEM's clients prefer to save in banks and savings institutions over informal systems of savings. Nonetheless, many of these clients do save through informal mechanisms. Moreover, it is evident from these data that the amount of money ADOPEM's clients save in the formal sector exceeds that which they save in the informal sector. Nonetheless, the savings of individuals within the lowest levels of savings (lower quartile) are rather homogeneously distributed amongst the different alternatives. The preference of use of formal savings systems is therefore positively correlated with the ability to save economic resources for future use.

Additional Sources of Income

All interviewed clients either have or at one point had their own business. In fact, a prerequisite to obtain a loan from ADOPEM is to own your own micro enterprise. Despite the fact that many of these people own business, however, many of them complement their income with additional sources and activities. In fact,

⁴An informal system of savings in which the individual hides their money in a secret location. Individuals usually hide this money even from family members

⁵An informal system of savings in which various participants pay up a monthly amount to a pool of money and each month one participant receives the total sum of the contributions until all individuals have received the total sum

62.1% of those who revealed their additional sources of income said they receive money from their spouse, 27.1% have a job on the side, 22.4% receive money from their children, 19.7% have an additional business and 19.5% receive money through remittances. Others receive regular flows of money from additional family members in the Dominican Republic (6.1%), from child support (5.5%), retirement pensions (4.9%), and other sources (5.7%).

Basic Business Characteristics

The majority of ADOPEM's clients own a small business ranging a broad array of undertakings. When asked what is the main commercial activity of your business? 25% of those interviewed replied selling clothes or shoes, 12.6% answered beauty salon, 10.2% said selling various goods, and 9.8% replied small convenience store. Other categories cited were small miscellaneous store (6.9%), cafeteria or small restaurant (5.6%), door-to-door sales (5.1%) and dressmaking/tailoring (4.2%).

69.9% of businesses owned by ADOPEM clients operate from the client's home; only 28.8% of the businesses operate from an independent location, while 1.3% of the businesses are mobile. Of those interviewed, 68.3% said they own the home or the independent location from where they operate their business.

On average, businesses owned by ADOPEM's clients have been operating 6.8 years. Nonetheless, 44.9% of clients have businesses that have been operating for only 2-5 years; 30.4% of businesses have been operating 6-10 years; 14.8% have been operating 11-20 years; and 5.8% have been operating for about 1 year. The percentage of business that has been operating for less than 1 year is 1.9%, while businesses with more than 20 years represent only 2.2% of the total.

Of the people who declared having merchandize in their business, on average, they hold merchandize with a value of RD\$49,811.03. Nonetheless, only the upper quartile owns merchandize whose value totals RD\$45,000.00 or more. The median client barely has RD\$15,000.00 in merchandize, which represents 100% of the total monthly sales of the median client. That is, the median client accumulates only enough merchandize he can sell in that month. Also, 13.3% of the total people in the sample said they do not know the value of their merchandize. When asked how often do you lose out on making a sale because of a lack of supplies or merchandize? 53.1% said never; 17.6% said once a month; 17.7% said twice a month; and 11.6% answered once or more per week. Deficiencies in restocking their businesses reduce the level of sales in almost half of the cases analyzed.

The monthly sales of ADOPEM's median client add up to RD\$15,000.00. Only the upper quartile exceeds monthly sales of RD\$28,000.00. Also, it should be noted that the lower quartile sells less than RD\$7,000.00 per month. Of those who answered the questions on sales, 3.8% reports to have no sales at all, while 15.3% of all those interviewed said they do not know how much they sell each month. Extreme cases in which clients reported to have no sales at all could potentially arise when the owners of the small business have other significant sources of income and the sales of their micro enterprize represent only a supplement to the overall household income. Some examples of micro enterprizes that lend themselves to this are those

that sell second-hand clothes from the home or those in which the client sells products from a catalogue. In fact, clients' monthly sales are negatively correlated with income from another job, income from their spouse and child support. This suggests that some people who have jobs on the side or who are dependents of others do not have the time or the incentives to make sure their small businesses make a sale every month. On the other hand, sales are positively correlated to additional income from other businesses owned by the client and remittances; this suggests that for some people who have these additional sources of income, these extra funds serve as capital that they can reinvest in their businesses and thereby increase their sales. With respect to business expenditures, the median client spends RD\$8,000.00 per month. The expenses of the upper quartile, however, exceed RD\$16,000.00, while those in the lower quartile of business expenditures do not spend more than RD\$2,000.00 per month. Approximately, 14% of those interviewed said they have no expenses whatsoever and 15.6% of all clients interviewed say they are not aware of how much their businesses spend per month. In the case of these last two groups, the apparent absence of business expenditures or the inability to report on these at all, suggests there exists a deficiency in the accounting practices of these clients. These deficiencies could arise because the client simply does not know how to calculate his expenses or because she does not know how to distinguish between household expenditures and those of the business.

In tables 2.1 and 2.2 we present the summary statistics for the outcome variables of the study. Table 2.1 shows the statistics for the entire sample and table 2.2 presents the statistics by type of loan (individual loan and group loan). In table 2.1, we observe that entrepreneurs on average eat out once a month, that they save DR\$ 3,864 per month (apx. \$ 109), that they have monthly sales of DR\$ 35,517 (apx. \$ 1000), and that they have monthly costs of DR\$ 16,311 (approx. \$ 459); on a bad week they sell on average DR\$ 5,171 (approx. \$ 146), which is 42% less than what they sell on an average week. Finally regarding accounting practices, 58% of the entrepreneurs keep accounts of sales, 42% have different accounts for their business and their household and 56% keep cash for their business in a different place from where they keep cash for the household.

In table 2.2 we present the summary statistics for the outcome variables by type of loan held by the entrepreneurs. In the first three columns, we present statistics for entrepreneurs that hold individual loans; in columns four to six, we present statistics for entrepreneurs that hold group loans; and in columns seven and eight, we present the difference between these results. From this data, we can observe that the average loan size for entrepreneurs with individual loans is DR\$ 42,110, and the average loan size for entrepreneurs with group loans is DR\$ 27,150, the difference between the two groups is DR\$ 14,960 (significant at the 1% level). On average, weekly sales are of DR\$ 9,960 for entrepreneurs with individual loans and DR\$ 7,162 for entrepreneurs with group loans; the difference is DR\$ 2798 (significant at the 1% level). The rest of the measures for sales are also significantly higher for entrepreneurs with individual loans compared to entrepreneurs with group loans. Costs are also higher for entrepreneurs with individual loans. The average monthly cost is DR\$ 17,213 for entrepreneurs with individual loans and DR\$ 14,972 for entrepreneurs with group loans, however, the difference is not statistically significant. There are no significant differences

between the two groups in measures concerning accounting practices. The only exception is the probability of keeping track of sales, which is 6% higher for entrepreneurs with individual loans; however, the difference is only significant at the 10% level.

2.5 Results

Results are shown in tables 2.3 to 2.9. In tables 2.3 to 2.5 we present the effect of class work training, in these tables we compare the performance of the entrepreneurs who were offered training with the performance of the entrepreneurs who were not offered training. In tables 2.6 and 2.7 we show the effect of getting on-site advice, in these tables we only consider clients who accepted the training. Among them we compare the performance of the entrepreneurs who got on-site advice with the performance of the entrepreneurs who did not get on-site advice. In tables 2.8 and 2.9 we only consider entrepreneurs who were offered training. Among them we compare the performance of the entrepreneurs who accepted the invitation to receive training with the performance of the entrepreneurs who rejected the invitation to receive training.

All the regressions are estimated using 3 different sets of controls β_1 was estimated without controls, β_2 was estimated using type of business, loan amount and existence of savings account in ADOPEM as controls. Finally β_3 was estimated using the same controls we used in the estimation of β_2 plus type of loan,⁶ age, sex, marital status, and number of children. In the description that follows we call a difference significant only if the difference is significant at least for the second and third set of controls.

In table 2.3, we observe that the value of most variables does not show a significant difference between the entrepreneurs who were offered training and the entrepreneurs who were not offered training. The only exceptions are: i) sales during slow days: entrepreneurs who were offered cash management training sold DR\$ 424 more (significant at the 10% level) than similar clients who were not offered training, and ii) practices regarding accounting and cash management and separation: entrepreneurs who were offered training have approximately a 10% higher probability of maintaining business accounts and cash from the business separate from household accounts and cash than similar clients who were not offered training. The difference in cash and accounting practices are significant at the 5% level. It is important to note that clients who were offered accounting training do not show significant differences in profile compared to clients who were not offered training.

In table 2.4 we repeat the analysis in table 2.3 including only the entrepreneurs that have individual loans. We observe that the variables that show significant differences in table 2.3 still show significant differences in the analysis in table 2.4. Furthermore the difference in sales during slow days between clients who were offered cash management training and clients who were not offered training is bigger and more significant for entrepreneurs with individual loans, a difference of DR\$ 810, significant at the 5% level. Also for this set of entrepreneurs the difference in sales during slow weeks between clients who were offered

⁶This control was omitted in the estimations where only one type of loan was included.

cash management training and clients who were not offered training at all is significant at the 10% level, a difference of DR\$ 2207. The measures concerning accounting practices are also higher for clients with individual loans who were offered cash management training compared to clients with individual loans who were not offered training. Specifically the clients with individual loans who were offered training have a 9% higher probability of keeping accounts of sales, an 11% higher probability of maintaining business accounts separate from household accounts and a 15% higher probability of keeping cash from the business separate from cash from the household than similar entrepreneurs who were not offered training. The level of significance for the differences in accounting practices ranges from 10% to 1% (10% for the probability of keeping accounts of sales, 5% for the probability of maintaining business accounts separate from household accounts and 1% for the probability of maintaining cash from the business separate from cash from the household). As in the case of the findings in table 2.3, clients who were offered accounting training do not show significant differences in outcome variables compared to clients who were not offered training.

In table 2.5 we repeat the analysis in table 2.3 including only entrepreneurs that have group loans. We observe that for this set of entrepreneurs most of the variables do not show a significant difference between clients who were offered training and clients who were not offered training. There are a few exceptions: the monthly savings of clients who were offered cash flow management training are DR\$ 3973 higher than the monthly savings of clients who were not offered training, the average monthly sales of clients who were offered accounting training are DR\$ 11,140 higher than the average monthly sales of entrepreneurs who were not offered training, and the probability of purchasing consumption goods is 12% higher for people who were offered accounting training compared to people who were not offered training. However, none of the aforementioned differences are significant at the 1% level.

In table 2.6 we present the effect of on-site advice for clients who enrolled in accounting training. We observe that most variables show no significant differences between entrepreneurs who got on-site advice and entrepreneurs who did not get on-site advice. The only variables that show a significant difference are the probability of eating out, which is 64% (significant at 10% level) higher for entrepreneurs who got on-site advice compared to similar entrepreneurs who did not get on-site advice, and sales during slow days which are on average DR\$ 518 higher (significant at 5% level) for entrepreneurs who received on-site advice compared to similar entrepreneurs who did not receive on-site advice.

In table 2.7 we present the effect of on-site advice for entrepreneurs who enrolled in the cash management training. We observe that for entrepreneurs enrolled in this type of training, none of the variables show a significant difference between entrepreneurs who received on-site advice compared to similar entrepreneurs who did not receive on-site advice.

In table 2.8 we present the differences at the time of the baseline survey between entrepreneurs who enrolled in the training and entrepreneurs who were offered training but did not enroll in the training. We observe that entrepreneurs who enrolled in the training have DR\$ 247 lower sales during slow days (significant at the 5% level) compared to entrepreneurs who did not enroll in the training. Entrepreneurs who enrolled

in the training also eat out less frequently than entrepreneurs who did not enroll in the training. Finally, the average loan size of entrepreneurs that enrolled in the training is DR\$ 931 bigger than the average loan size of entrepreneurs who did not enroll in the training; however, this difference is significant only at the 10% level.

Finally in table 2.9 we show the change in outcome variables of entrepreneurs who enrolled in the training compared to the change in the outcome variables of entrepreneurs who were offered training but did not enroll in the training. We observe that clients who enrolled in the training show a decrease of DR\$ 518 in their average daily sales compared to the clients who did not enroll in the training, they also show a decrease of DR\$ 2828 in their average weekly sales compared to similar clients who did not enroll in the training. Finally, entrepreneurs who enrolled in the training reported an improvement in all the accounting practices compared to similar clients who did not enroll in the training: a 10% increase at a 5% level in the likelihood of keeping accounts of sales, a 13% increase at a 1% level in the likelihood of maintaining separate accounts for the business and for the household and a 9% increase at a 5% level in the likelihood of maintaining cash from the business and cash from the household in separate places.

2.6 Discussion and Conclusion

The results in this chapter show that financial education can improve entrepreneurs' accounting practices, which in turn can increase sales and act as a buffer for negative shocks. In particular, we show that teaching basic skills for separating business accounts from household accounts and for separating business cash from household cash to entrepreneurs who hold individual loans can increase by up to 15% the probability of implementing these practices in their businesses, compared to similar clients who are not offered training. Teaching these types of skills also has a beneficial effect on entrepreneurs' sales. In particular, entrepreneurs with individual loans who were offered cash management training increased their sales during slow days on average by DR\$ 810 and increased their sales during slow weeks on average by DR\$ 2207, compared to similar entrepreneurs who were not offered training.

Notwithstanding these results, financial education was not beneficial for entrepreneurs holding group loans. In particular, we did not find any significant differences in business practices and business performance between entrepreneurs with group loans who were offered training compared to similar entrepreneurs who were not offered training. The lack of effect persisted even after controlling for education and loan amount. A potential explanation for this finding is that group-loan entrepreneurs have smaller and more informal businesses and oftentimes their business is not the only source of income. As a result, keeping business accounts is comparatively costly for these entrepreneurs and they may be less inclined to do so.

Among the two training programs that were offered in this experiment, only the training on cash management had a significant effect on businesses practices and performance. Entrepreneurs who were offered accounting training did not improve their accounting practices and did not increase their sales compared

to similar clients who were not offered training. The lack of effect arising from the accounting training program may be a consequence of the complexity of the covered materials and/or the longer time it requires to be successfully implemented in the business. With the current data it is not possible to identify the reason why this type of training program did not have an effect on accounting practices and performance of entrepreneurs.

It is interesting to note that clients who accepted the offer to enroll in a training program had lower sales and lower consumption (measured as the number of times they ate out of their house) than clients who did not enroll in the training. The sales of these entrepreneurs also declined over time compared to the sales of entrepreneurs that did not enroll in the training. This shows that clients who are experiencing problems in their business are more prone to enroll in training programs.

In sum, the results in this chapter suggest that teaching simple and easy to implement cash management skills to entrepreneurs can have a significant effect on the practices and the performance of businesses owned by small entrepreneurs. Furthermore, the fact that clients who are experiencing problems within their business are more likely to enroll in financial training programs, makes of financial education a promising tool to selectively improve the performance of entrepreneurs that have high risk of default.

Appendix

Table 2.1: Summary Statistics At Baseline and Follow Up Survey

In this table I present summary statistics for the sample at the time of the baseline and follow up surveys.

variable	baseline			follow up		
	N	mean	sd	N	mean	sd
change in econ	1182	1.82	0.71	1031	1.94	0.78
eat Out N	1105	1.41	3.03	988	1.01	2.27
save Last M	740	2704.32	5644.06	549	3863.56	10067.44
avg. day sales	982	1385.44	2205.27	660	1644.93	2715.69
avg. week sales	972	6590.67	10719.19	683	8965.73	15282.41
avg. bi-wk sales	952	13254.50	23184.68	699	17537.47	28933.72
avg. month sales	955	26086.55	43385.30	716	35517.01	61589.32
last week sales	940	5317.37	9803.86	637	6943.14	12833.16
bad day sales	1029	793.97	2066.98	693	929.82	1764.27
bad week sales	960	3729.67	8253.21	664	5171.41	10624.21
week costs	941	3586.77	9431.67	629	3616.18	7655.26
month costs	945	14482.54	26646.43	637	16311.82	25191.24
bought cell	871	0.04	0.19	919	0.08	0.28
bought something	1193	0.25	0.44	967	0.21	0.40
sales acc.	1161	0.80	0.40	1031	0.58	0.49
acc. sep.	1160	0.53	0.50	1031	0.42	0.49
cash sep.	1159	0.74	0.44	1031	0.56	0.50
pref job	1193	0.74	0.44	1031	0.63	0.48
loan size	1191	26514.39	17411.24	1029	36243.73	25168.68
loan other banks	1181	9578.27	42126.18	1020	14098.51	56428.98

Table 2.2: Summary Statistics for Entrepreneurs with Individual Loans and Entrepreneurs with group loans

In this table I present summary statistics for the entrepreneurs with individual loans and the entrepreneurs with group loans at the time of the follow up survey.

variable	Individual loans			Group loans			Difference	
	N	mean	sd	N	mean	sd	difference	sd
change in econ	627	1.90	0.79	412	1.99	0.78	-0.09*	0.05
eat Out N	605	1.06	2.36	391	0.92	2.10	0.14	0.14
save Last M	336	4390.77	10936.84	219	3107.05	8389.00	1283.72	823.01
avg. day sales	437	1819.92	3045.57	229	1350.87	1925.76	469.05**	193.44
avg. week sales	451	9960.48	17069.27	237	7162.11	10855.31	2798.37***	1069.22
avg. bi-wk sales	455	19564.84	32881.61	250	13946.76	19207.52	5618.08***	1962.65
avg. month sales	467	40330.79	71041.70	255	26912.55	36853.14	13418.24***	4016.62
last week sales	410	7852.95	14570.90	234	5544.95	8968.52	2308.01**	928.21
bad day sales	451	1067.16	2032.99	247	710.83	1103.53	356.33***	118.72
bad week sales	429	5802.48	12195.78	239	4182.22	7003.10	1620.26**	742.91
week costs	408	3747.60	7612.23	225	3424.71	7820.48	322.89	643.31
month costs	416	17213.98	24682.47	226	14971.74	26501.21	2242.24	2138.24
bought cell	564	0.08	0.27	362	0.09	0.29	-0.01	0.02
bought something	593	0.21	0.41	382	0.20	0.40	0.01	0.03
sales acc.	627	0.61	0.49	412	0.55	0.50	0.06*	0.03
acc. sep.	627	0.42	0.49	412	0.41	0.49	0.01	0.03
cash sep.	627	0.58	0.49	412	0.54	0.50	0.04	0.03
pref job	627	0.69	0.46	412	0.54	0.50	0.15***	0.03
loan size	626	42110.22	28931.21	411	27150.37	13624.74	14959.85***	1337.44
loan other banks	619	18383.27	69836.15	409	8193.73	24658.79	10189.54***	3060.34

Table 2.3: Effect of Accounting and Cash Management Training

In this table we simultaneously estimate the effect of cash management and accounting training on the change of outcome variables measured before and after the training. The first estimation does not include controls the second estimation includes the same controls that were used for in the clustering of the sample; type of business, loan amount and presence of savings account in the bank. The third estimation adds controls for type of debt (group or individual), age, sex, marital status and number of children.

variable	N	C	accounting			cash management		
			β_1	β_2	β_3	β_1	β_2	β_3
change in econ	1024	0.13** (0.05)	0.03 (0.07)	0.02 (0.07)	0.03 (0.07)	0 (0.07)	-0.01 (0.07)	0 (0.07)
eat out N	920	-0.39** (0.2)	0.03 (0.27)	0.03 (0.27)	-0.01 (0.27)	0.1 (0.27)	0.08 (0.27)	0.16 (0.27)
save last M	400	801.68 (1011.6)	467.66 (1451.16)	643.43 (1473.68)	537.11 (1518.27)	1503.74 (1375.06)	1572.74 (1397.88)	1470.76 (1440.25)
avg. day sales	553	107.94 (167.11)	-78.6 (236.01)	-75.6 (235.85)	-73.8 (240.23)	148.66 (234.44)	175.78 (235.32)	172.85 (238.02)
avg. week sales	573	1882.04** (855.62)	-52.15 (1210.03)	-158.68 (1204.69)	-176.91 (1235.46)	786.5 (1178.63)	760.53 (1176.25)	763.32 (1195.01)
avg. bi-wk sales	580	3384.39* (1767.36)	684.4 (2550.69)	727.64 (2551.81)	989.46 (2611.02)	11.47 (2477.79)	252.78 (2479.2)	317 (2517.24)
avg. month sales	587	6602.77** (2826)	142.17 (4083.45)	228.02 (4055.91)	770.72 (4126.9)	2240.71 (3952.88)	2804.04 (3926.54)	3060.99 (3972.26)
last week sales	508	1132.01 (801.81)	-267.6 (1153.03)	-250.25 (1155.81)	-460.75 (1161.25)	1090.78 (1133.94)	1204.96 (1138.75)	1139.95 (1131.09)
bad day sales	616	-144.49 (167.77)	153.03 (232.98)	147 (234.26)	151.74 (239.04)	366.95 (232.72)	407.76* (234.25)	423.66* (237.45)
bad week sales	552	1009.95 (627.42)	55.05 (892.27)	21.34 (893.2)	-0.64 (912.77)	1313.18 (875.67)	1387.01 (875.21)	1403.23 (882.39)
week costs	498	652.33 (756.23)	-1654.59 (1059.94)	-1736.96 (1065.36)	-1646.04 (1086.61)	-236.97 (1064.63)	-307.7 (1066.62)	-262.33 (1073.98)
month costs	509	-304.86 (2104.14)	-2114.28 (2950.66)	-2211.74 (2959.08)	-2045.75 (3028.39)	3767.29 (3050.57)	3539.99 (3058.82)	3512.38 (3078.79)
bought cell	710	0.05** (0.02)	-0.03 (0.03)	-0.03 (0.03)	-0.03 (0.03)	-0.01 (0.03)	-0.01 (0.03)	-0.02 (0.03)
bought someth.	967	-0.09*** (0.03)	0.04 (0.05)	0.03 (0.05)	0.03 (0.05)	0.06 (0.05)	0.06 (0.05)	0.05 (0.05)
sales acc.	1161	-0.3*** (0.03)	-0.02 (0.04)	-0.02 (0.04)	-0.02 (0.04)	0.05 (0.04)	0.05 (0.04)	0.05 (0.04)
acc. sep	1160	-0.22*** (0.03)	0.06 (0.04)	0.06 (0.04)	0.07 (0.04)	0.09** (0.04)	0.1** (0.04)	0.09** (0.04)
cash sep	1159	-0.26*** (0.03)	-0.02 (0.04)	-0.02 (0.04)	-0.02 (0.04)	0.08* (0.04)	0.09** (0.04)	0.09** (0.04)
pref job	1193	-0.19*** (0.03)	-0.02 (0.04)	-0.02 (0.04)	-0.03 (0.04)	0.02 (0.04)	0.01 (0.04)	0.02 (0.04)
loan size	1028	9511.8*** (969.4)	-441.59 (1354.14)	-295.62 (1338.52)	-346.82 (1346.73)	854.89 (1356.04)	1018.33 (1342.51)	923.6 (1343.93)
loan other banks	1010	-197.63 (2987.38)	9832.68** (4184.33)	10178.89** (4182.14)	11051.65*** (4241.21)	4041.27 (4184.33)	4495.22 (4188.28)	4776.08 (4223.58)
mean sales	302	6532.76 (5312.45)	4619.52 (7723.43)	4638.35 (7659.16)	4334.46 (7938.26)	2441.51 (7215.61)	3380.73 (7165.89)	3260.64 (7311.51)
std sales	302	-0.1*** (0.03)	0.04 (0.05)	0.05 (0.04)	0.04 (0.05)	-0.02 (0.04)	-0.01 (0.04)	-0.02 (0.04)

Table 2.4: Effect of accounting and cash management training on entrepreneurs with Individual loans

This table is similar to table 2.3 but only includes entrepreneurs with individual loans in the estimation. The first estimation does not include controls the second estimation includes the same controls that were used for in the clustering of the sample; type of business, loan amount and presence of savings account in the bank. The third estimation adds controls for type of debt (group or individual), age, sex, marital status and number of children.

variable	N	accounting			cash management			
		C	β_1	β_2	β_3	β_1	β_2	β_3
change in econ	622	0.04 (0.07)	0.06 (0.09)	0.05 (0.09)	0.04 (0.09)	0.06 (0.09)	0.04 (0.09)	0.04 (0.09)
eat out N	559	-0.8*** (0.28)	0.42 (0.39)	0.42 (0.39)	0.37 (0.39)	0.44 (0.38)	0.43 (0.39)	0.54 (0.39)
save last M	243	1203.16 (1442.04)	1108.13 (2082.59)	1490.93 (2120.8)	1629.14 (2212.59)	358.17 (1925.81)	744.17 (1989.27)	258.73 (2066.13)
avg. day sales	377	106.64 (221.14)	-137.98 (305.89)	-146.37 (305.87)	-123.64 (313.71)	299.71 (302.05)	373.94 (309.13)	355.16 (314.76)
avg. week sales	385	1363.46 (1163.61)	-141.59 (1609.85)	-202.62 (1600.44)	-194.03 (1642.03)	2004.75 (1576.56)	2338.58 (1598.32)	2362.95 (1625.8)
avg. bi-wk sales	386	3063.82 (2565.07)	-330.35 (3620.24)	-564.43 (3625.19)	-133.01 (3723.1)	494.16 (3521.62)	1049.1 (3573.75)	1098.71 (3660.18)
avg. month sales	392	7468.94* (3897.12)	-3219.51 (5522.55)	-3924.32 (5466.89)	-3325.24 (5588.73)	2112.44 (5308.07)	2906.39 (5314.28)	3107.73 (5412.78)
last week sales	330	1085 (1116.45)	-600.14 (1597.23)	-505.53 (1597.32)	-910.37 (1614.99)	1817.05 (1582.45)	2330.2 (1595.48)	2142.61 (1598.2)
bad day sales	409	-294.92 (245.15)	352.76 (339.12)	358.38 (339.94)	367.69 (349.01)	669.15** (336.85)	795.9** (342.92)	809.74** (350.55)
bad week sales	362	1111.2 (888.23)	-237.06 (1258.84)	-293.65 (1249.41)	-240.64 (1284.37)	1977.87 (1226.58)	2113.89* (1229.93)	2206.55* (1252.45)
week costs	329	-396.38 (1008.8)	-1300.42 (1395.3)	-1504.71 (1408.65)	-1503.19 (1439.82)	1069.68 (1413.51)	875.82 (1442.54)	987.76 (1460.7)
month costs	343	-1434.61 (2587.48)	-3305.35 (3606.37)	-3668.86 (3625.4)	-3432.75 (3656.48)	5295.26 (3736.11)	4964.71 (3807.23)	5263.26 (3784.55)
bought cell	452	0.02 (0.03)	-0.01 (0.03)	-0.01 (0.03)	-0.01 (0.03)	0.04 (0.03)	0.05 (0.03)	0.03 (0.03)
bought someth.	593	-0.06 (0.04)	-0.03 (0.06)	-0.03 (0.06)	-0.03 (0.06)	0.03 (0.06)	0.03 (0.06)	0.02 (0.06)
sales acc.	722	-0.32*** (0.04)	0.01 (0.05)	0.01 (0.05)	-0.01 (0.05)	0.11** (0.05)	0.11** (0.05)	0.09* (0.05)
acc. sep	721	-0.21*** (0.04)	0.04 (0.06)	0.05 (0.06)	0.05 (0.05)	0.12** (0.06)	0.13** (0.06)	0.11** (0.05)
cash sep	720	-0.27*** (0.04)	0.02 (0.06)	0.02 (0.05)	0.01 (0.05)	0.15*** (0.05)	0.16*** (0.05)	0.15*** (0.05)
pref job	732	-0.21*** (0.04)	-0.01 (0.05)	-0.01 (0.05)	-0.03 (0.05)	0.05 (0.05)	0.05 (0.05)	0.03 (0.05)
loan size	625	12007.15*** (1337.12)	445 (1865.93)	750.32 (1850.47)	800.66 (1897.66)	-141.46 (1847.1)	148.01 (1845.17)	244.14 (1873.61)
loan other banks	613	-1036.01 (4865.99)	14697.13** (6797.1)	15451.53** (6807.23)	17275.46** (6978.83)	6010.66 (6734.59)	7493.18 (6798.16)	7839.03 (6895.75)
mean sales	218	4826.72 (7239.23)	3764.35 (10016.03)	2175.08 (9939.94)	1874.69 (10285.85)	6077.75 (9609.12)	5978.66 (9646.71)	6030.55 (9906.57)
std sales	218	-0.08** (0.04)	0.04 (0.05)	0.04 (0.05)	0.04 (0.05)	0.01 (0.05)	0 (0.05)	0.01 (0.05)

Table 2.5: Effect of accounting and cash management training on entrepreneurs with group loans, difference estimation

This table is similar to table 2.3 but only includes entrepreneurs with group loans in the estimation. The first estimation does not include controls the second estimation includes the same controls that were used for in the clustering of the sample; type of business, loan amount and presence of savings account in the bank. The third estimation adds controls for type of debt (group or individual), age, sex, marital status and number of children.

variable	N	C	accounting			cash management		
			β_1	β_2	β_3	β_1	β_2	β_3
change in econ	410	0.25*** (0.08)	0 (0.11)	0.01 (0.11)	0.01 (0.11)	-0.08 (0.11)	-0.09 (0.11)	-0.1 (0.11)
eat out N	368	0.22 (0.26)	-0.55 (0.35)	-0.57 (0.36)	-0.52 (0.34)	-0.55 (0.37)	-0.57 (0.37)	-0.37 (0.36)
save last M	163	219.91 (1261.04)	-396.83 (1800.44)	-204.26 (1856.02)	-75.29 (1944.49)	3399.72* (1759.76)	3854.96** (1835.18)	3972.51** (1945.85)
avg. day sales	181	136.4 (234.32)	33.43 (345.37)	138.65 (351.29)	150.08 (364.55)	-249.31 (350.42)	-289.14 (352.47)	-176.16 (358.82)
avg. week sales	192	2790.74** (1110.39)	317.89 (1636.61)	923.59 (1660.83)	674.93 (1713.16)	-1631.64 (1582.17)	-1472.85 (1595.4)	-1636.7 (1617.72)
avg. bi-wk sales	199	4006.62** (1721.59)	2628.97 (2584.81)	3889.99 (2604.95)	4260.39 (2675.87)	-1161.17 (2507.38)	-818.86 (2510.98)	-231.55 (2543.8)
avg. month sales	200	5482.67 (3597.62)	5843.56 (5371.8)	9161.33* (5429.64)	11139.8** (5560.15)	1240.77 (5301.91)	2381.01 (5307.69)	4303.04 (5385.77)
last week sales	183	869.33 (1021.77)	642.16 (1482.54)	1198.66 (1443.56)	1045.5 (1407.59)	169 (1445)	-63.01 (1401.91)	-143.37 (1347.22)
bad day sales	212	139.71 (129.93)	-212.93 (181.85)	-195.9 (184.4)	-198.49 (192.67)	-235 (184.41)	-268.71 (185.01)	-221.34 (191.04)
bad week sales	194	966.67 (694.21)	379.74 (989.4)	703.44 (1010.26)	875.56 (1041.4)	-208.07 (989.4)	-372.12 (1008.05)	-103.41 (1020.16)
week costs	171	2550.86** (1065.56)	-1823.18 (1520.32)	-1522.96 (1562.94)	-1112.21 (1602.94)	-2628.76* (1513.52)	-2515.88 (1540.53)	-2045.1 (1547.87)
month costs	167	1935.17 (3599.61)	551.9 (5090.62)	396.05 (5313.93)	5595.14 (5258.45)	699.59 (5262.4)	825.55 (5394.09)	3641.28 (5179.35)
bought cell	264	0.09*** (0.04)	-0.06 (0.05)	-0.06 (0.05)	-0.07 (0.05)	-0.08 (0.05)	-0.08 (0.05)	-0.11** (0.05)
bought someth.	382	-0.13** (0.05)	0.13* (0.07)	0.12* (0.07)	0.1 (0.07)	0.12 (0.07)	0.12 (0.07)	0.11 (0.07)
sales acc.	448	-0.28*** (0.05)	-0.06 (0.07)	-0.06 (0.07)	-0.07 (0.06)	-0.05 (0.07)	-0.04 (0.07)	-0.03 (0.07)
acc. sep	448	-0.24*** (0.05)	0.09 (0.07)	0.08 (0.07)	0.07 (0.07)	0.05 (0.07)	0.06 (0.07)	0.06 (0.07)
cash sep	447	-0.25*** (0.05)	-0.08 (0.07)	-0.07 (0.07)	-0.08 (0.07)	-0.04 (0.07)	-0.02 (0.07)	0 (0.07)
pref job	471	-0.16*** (0.05)	-0.03 (0.07)	-0.03 (0.07)	-0.03 (0.07)	-0.03 (0.07)	-0.03 (0.07)	-0.01 (0.07)
loan size	410	5959.56*** (1273.74)	-2029.98 (1782.21)	-1840.63 (1773.62)	-1974.91 (1789.47)	1809.53 (1814.93)	1774.36 (1809)	2171.42 (1821.4)
loan other banks	404	2164.44 (1630.67)	1350.22 (2293.55)	1245.97 (2313.14)	2633.75 (2184.87)	362.91 (2323.66)	464.45 (2348.49)	1110.6 (2214.44)
mean sales	87	10108.57* (5910.35)	9945.38 (9963.99)	11014.32 (10438.67)	9944.5 (10829.58)	-6660.39 (8484.19)	-6025.86 (9141.11)	-6100.63 (9132.84)
std sales	87	-0.12** (0.05)	0.05 (0.08)	0.05 (0.09)	0.02 (0.09)	-0.08 (0.07)	-0.08 (0.07)	-0.1 (0.08)

Table 2.6: Effect of On-site Advice for Entrepreneurs Enrolled in Accounting Training

In this table we present the effect of on-site advice on the entrepreneurs who enrolled in the accounting training. The first estimation does not include controls the second estimation includes the same controls that were used for in the clustering of the sample; type of business, loan amount and presence of savings account in the bank. The third estimation adds controls for type of debt (group or individual), age, sex, marital status and number of children.

variable	N	C	β_1	β_2	β_3
change in econ	169	0.19* (0.1)	-0.07 (0.15)	-0.11 (0.14)	-0.11 (0.14)
eat out N	152	-0.4*** (0.14)	0.61*** (0.21)	0.61*** (0.21)	0.64*** (0.21)
save last M	67	191.18 (1339.41)	2799.73 (1908.5)	1944.83 (1756.39)	1723.09 (1876.5)
avg. day sales	98	-480.57* (266.11)	270.57 (392.71)	250.44 (395.64)	443.32 (406.45)
avg. week sales	94	-559.57 (1126.47)	778.72 (1593.07)	647.81 (1609.11)	1419.58 (1669.24)
avg. bi-wk sales	92	735.42 (2365.12)	586.17 (3419.96)	512.87 (3401.13)	1414.32 (3531.62)
avg. month sales	95	1195.6 (4908.61)	-2904.49 (7132.05)	-3037.99 (7212.4)	-435.65 (7557.53)
last week sales	86	-585 (1160.71)	1443.04 (1587.06)	1394.41 (1644.04)	2102.47 (1737.41)
bad day sales	113	-222.75 (136.64)	450.49** (199.51)	415.96** (202.68)	517.74** (212.93)
bad week sales	92	-665.21 (690.12)	1231.12 (997.91)	870.18 (986.25)	1947.52* (1035.91)
week costs	86	603.02 (1086.37)	-1412.61 (1536.36)	-1247.67 (1538.4)	743.26 (1436.9)
month costs	92	-2567.35 (2902.21)	-1255.33 (4245.1)	-830.94 (4251.43)	3060.65 (3957.56)
bought cell	129	0.03 (0.03)	0 (0.04)	0.01 (0.04)	0 (0.04)
bought someth.	163	-0.02 (0.06)	-0.08 (0.08)	-0.08 (0.08)	-0.11 (0.09)
sales acc.	179	-0.22*** (0.06)	-0.02 (0.09)	-0.03 (0.09)	-0.02 (0.09)
acc. sep	178	-0.04 (0.06)	0.01 (0.09)	0 (0.09)	0.01 (0.09)
cash sep	179	-0.22*** (0.06)	0.06 (0.09)	0.04 (0.09)	0.03 (0.09)
pref job	184	-0.15*** (0.06)	-0.01 (0.08)	-0.01 (0.09)	-0.02 (0.08)
loan size	172	8793.48*** (1827.74)	1019.02 (2679.99)	689.38 (2721.29)	1147.08 (2725.91)
loan other banks	169	21898.45** (9434)	-19754.7 (13711.79)	-18848.99 (13547.2)	-19314.51 (14016.93)
mean sales	45	6408.7 (7603.34)	-11097.33 (10874.25)	-9956.17 (11143.79)	-22624.39* (13633.43)
std sales	45	-0.07 (0.07)	0.02 (0.11)	0.03 (0.11)	0.08 (0.14)

Table 2.7: Effect of On-site Advice for Entrepreneurs Enrolled in Cash Management Training

In this table we present the effect of on-site advice on the entrepreneurs who enrolled in cash management training. The first estimation does not include controls the second estimation includes the same controls that were used for in the clustering of the sample; type of business, loan amount and presence of savings account in the bank. The third estimation adds controls for type of debt (group or individual), age, sex, marital status and number of children.

variable	N	C	β_1	β_2	β_3
change in econ	157	0.17*	0.02	0.04	0.02
		(0.1)	(0.15)	(0.15)	(0.16)
eat out N	139	-0.22	0.14	0.15	0.04
		(0.2)	(0.3)	(0.31)	(0.33)
save last M	73	4521.28*	-843.62	-1270.55	-345.92
		(2560.2)	(4289.92)	(4470.7)	(5064.13)
avg. day sales	89	-168.16	863.16	734.48	801.32
		(380.58)	(567.68)	(534.28)	(577.73)
avg. week sales	96	1014.55	2639.11	2225.86	1955.19
		(1618.69)	(2476.89)	(2410)	(2485.67)
avg. bi-wk sales	102	2814.75	5748.66	4966.51	5158.65
		(2940.03)	(4637.24)	(4371.45)	(4654.7)
avg. month sales	101	7944.83	6885.41	4411.54	4439.97
		(6306.11)	(9664.7)	(9521.91)	(10213.48)
last week sales	88	829.53	1799.56	1343.7	380.4
		(1138.91)	(1805.91)	(1676.58)	(1677.89)
bad day sales	106	60.75	539.47	426.11	383.65
		(269.06)	(408.44)	(400.01)	(426.86)
bad week sales	91	1157.27	1956.34	1670.28	1549.72
		(842.83)	(1340.01)	(1346.18)	(1447.58)
week costs	88	686.79	514.92	-461.38	-878.66
		(1002.78)	(1590.05)	(1579.67)	(1694.08)
month costs	77	4394.92	-571.31	-2496.17	-879.79
		(2820.54)	(4518.74)	(4452.6)	(4814.42)
bought cell	117	0.07*	-0.05	-0.04	-0.04
		(0.04)	(0.06)	(0.06)	(0.06)
bought someth.	151	-0.03	0.02	0.04	0.04
		(0.06)	(0.1)	(0.1)	(0.11)
sales acc.	171	-0.18***	0.03	0.03	0.01
		(0.06)	(0.09)	(0.09)	(0.09)
acc. sep	171	-0.05	0.01	0.02	0.01
		(0.07)	(0.1)	(0.1)	(0.1)
cash sep	171	-0.08	-0.06	-0.03	-0.07
		(0.06)	(0.09)	(0.09)	(0.1)
pref job	174	-0.15***	0.01	0.02	-0.01
		(0.05)	(0.08)	(0.08)	(0.08)
loan size	158	11046.89***	582.52	596.85	1931.91
		(2190.02)	(3338.28)	(3354.45)	(3604.76)
loan other banks	157	4456.18	4290.88	4830.92	4248.78
		(3476.1)	(5281.86)	(5375.07)	(5675.25)
mean sales	60	-455	19582.5	15102.6	15991.99
		(10922.81)	(15447.19)	(15213.07)	(16602.94)
std sales	60	-0.17***	0.08	0.09	0.07
		(0.06)	(0.08)	(0.09)	(0.09)

Table 2.8: Differences Between People who Enrolled in Training and People who did not Enroll in Training

In this table we present the difference in the value of outcome variables, at the time of the baseline, between the entrepreneurs who were offered training and accepted the offer and entrepreneurs who were offered training but rejected the offer. The first estimation does not include controls the second estimation includes the same controls that were used for in the clustering of the sample; type of business, loan amount and presence of savings account in the bank. The third estimation adds controls for type of debt (group or individual), age, sex, marital status and number of children.

variable	N	C	β_1	β_2	β_3
change in econ	796	1.82*** (0.03)	-0.02 (0.05)	-0.01 (0.05)	0.01 (0.05)
eat out N	753	1.61*** (0.14)	-0.63*** (0.21)	-0.61*** (0.21)	-0.48** (0.21)
save last M	495	2926.33*** (389.02)	-415.62 (569.47)	-247.69 (572.37)	-247.46 (586.18)
avg. day sales	662	1468.87*** (124.77)	-95.62 (182.92)	-62.06 (174.36)	-17.03 (178.22)
avg. week sales	654	7104.97*** (553.21)	-1439.95* (827.92)	-1234.98 (772.36)	-944.6 (770.2)
avg. bi-wk sales	637	14996.97*** (1334.59)	-3611.72* (1988.27)	-3065.49 (1877.75)	-2756.17 (1895.87)
avg. month sales	637	28346.27*** (2429.43)	-5446.62 (3613.08)	-4665.21 (3407.32)	-4232.84 (3443.57)
last week sales	627	5230.91*** (511.59)	-472.88 (757.49)	-244.36 (703.68)	246.52 (694.27)
bad day sales	698	869.93*** (78.72)	-280.78** (115.72)	-247.9** (112.44)	-247.21** (115.28)
bad week sales	643	3862.04*** (361.88)	-889.11* (538.85)	-772.23 (505.99)	-380.49 (506.96)
week costs	632	4340.96*** (587.54)	-920.38 (861.43)	-789.91 (839.88)	-713.01 (861.87)
month costs	625	15189.09*** (1596.62)	-1062.68 (2372.74)	-644.79 (2276.43)	227.48 (2293.01)
bought cell	590	0.04*** (0.01)	-0.01 (0.02)	-0.01 (0.02)	-0.01 (0.02)
bought someth.	806	0.26*** (0.02)	-0.04 (0.03)	-0.04 (0.03)	-0.03 (0.03)
sales acc.	782	0.81*** (0.02)	-0.01 (0.03)	0 (0.03)	0 (0.03)
acc. sep	781	0.54*** (0.02)	-0.04 (0.04)	-0.04 (0.04)	-0.03 (0.04)
cash sep	781	0.72*** (0.02)	0.03 (0.03)	0.03 (0.03)	0.02 (0.03)
pref job	806	0.72*** (0.02)	0.01 (0.03)	0.02 (0.03)	0.02 (0.03)
loan size	805	26408.9*** (807.82)	34.62 (1211.35)	859.62* (519.91)	930.6* (529.18)
loan other banks	797	10462.42*** (1739.87)	-2462.39 (2610.62)	-2489.06 (2574.87)	-2266.75 (2640.09)

Table 2.9: Effect of Treat on The Treated

In this table we compare the change in the value of the outcome variables (values reported in the baseline compared to values reported in the follow up) between people who were offered the training and accepted the offer, and people who were offered training but rejected the offer. The effect on this table will mingle two effects: the trend of people who decide to self select into the training and the effect of the training itself. The first estimation does not include controls the second estimation includes the same controls that were used for in the clustering of the sample; type of business, loan amount and presence of savings account in the bank. The third estimation adds controls for type of debt (group or individual), age, sex, marital status and number of children.

variable	N	C	β_1	β_2	β_3
change in econ	691	0.12** (0.05)	0.05 (0.07)	0.03 (0.07)	0.03 (0.07)
eat out N	627	-0.48*** (0.13)	0.33* (0.19)	0.33* (0.19)	0.3 (0.19)
save last M	272	669.62 (1079.74)	2282.66 (1505.02)	2643.27* (1575.7)	2537.77 (1647.48)
avg. day sales	371	374.84** (183.92)	-456.98* (259.06)	-518.03** (258.69)	-518.38** (264.13)
avg. week sales	389	3488.19*** (915.76)	-2490.3* (1310.33)	-2652.38** (1303.03)	-2828.41** (1343.8)
avg. bi-wk sales	384	4260.84** (2068.66)	-1084.3 (2910.4)	-1376.05 (2906.38)	-972.69 (3016.22)
avg. month sales	389	10242.49*** (3184.02)	-4725.24 (4485.61)	-5924.01 (4447.64)	-5212.73 (4574.24)
last week sales	335	2313.82** (918.11)	-1439.95 (1273.92)	-1523.1 (1279.78)	-1673.01 (1310.07)
bad day sales	421	92.95 (103)	43.86 (142.81)	21.21 (143.27)	18.46 (146.07)
bad week sales	370	2496.79*** (696.64)	-1574.88 (990.56)	-1627.91 (991.26)	-1716.77* (1013.97)
week costs	335	-1055.96 (811.9)	1455.84 (1126.54)	1560.32 (1139.34)	1705.64 (1175.22)
month costs	336	475.95 (1946.02)	-291.96 (2743.93)	-787.99 (2762.81)	-718.44 (2815.12)
bought cell	486	0.01 (0.02)	0.03 (0.03)	0.03 (0.03)	0.03 (0.03)
bought someth.	655	-0.04 (0.03)	-0.01 (0.04)	-0.01 (0.04)	-0.02 (0.04)
sales acc.	782	-0.36*** (0.03)	0.16*** (0.04)	0.16*** (0.04)	0.1** (0.04)
acc. sep	781	-0.23*** (0.03)	0.18*** (0.04)	0.19*** (0.04)	0.13*** (0.04)
cash sep	781	-0.3*** (0.03)	0.15*** (0.04)	0.15*** (0.04)	0.09** (0.04)
pref job	806	-0.23*** (0.03)	0.08* (0.04)	0.07* (0.04)	0.01 (0.04)
loan size	696	9245.14*** (934.43)	994.32 (1357.04)	1130.27 (1346.48)	1096.32 (1359.94)
loan other banks	682	4169.59 (2817.17)	5376 (4074.71)	5756.36 (4068.84)	5772.96 (4143.94)
mean sales	204	14323.13** (5951.71)	-8566.7 (8295.88)	-8680.35 (8132.15)	-8100.53 (8539.1)
std sales	204	-0.07** (0.03)	-0.03 (0.04)	-0.03 (0.04)	-0.06 (0.05)

Chapter 3

The Effect Credit Insurance on Liquidity Constraints and Default Rates: Evidence from a Governmental Intervention

3.1 Introduction

An important body of literature documents a positive and significant correlation between financial market development and entrepreneurship.¹ This strong correlation has motivated interventions in the financial markets by several governments and international financial institutions.² These interventions are designed to improve entrepreneurs' access to finance and to minimize potential economic distortions. However there is little research on how these interventions improve entrepreneurs' access to finance and to what extent these interventions may generate costly economic distortions. Understanding the real implications of these interventions can be extremely important for researchers and policy makers working on the design of these interventions.

One type of intervention that has been widely used in recent years to increase entrepreneurs' access to finance is Partial Credit Guarantee. The World Bank has actively promoted and supported the implementation of partial credit guarantee programs in developing countries. In these interventions a third party, usually the government, guarantees a fraction of the principal's repayment to the issuing bank in the event that the debtor defaults. The fraction of the principal to be guaranteed is established in the debt contract at the time the loan is issued. By insuring a fraction of the loan, the government reduces the risk assumed by the bank, increasing the range of loans that are profitable for the bank. Given that only a fraction of the principal is insured, it is still in the interest of the bank to screen and monitor the insured clients. However

¹See among others Jayaratne & Strahan 1996, Evans & Jovanovic 1989

²For example, the Inter-American Development Bank estimates that their interventions to reduce financial market deficiencies in Latin America and the Caribbean in 1990 and 2004 account for a total of US\$ 22 billion.

the presence of insurance can still affect the effort banks expend monitoring insured clients. The insurance administrator usually charges an insurance fee that is proportional to the default rate of the insured clients. By insuring the entrepreneurs' loans, instead of directly issuing the loans, the government can target a larger number of entrepreneurs using less capital. There is also anecdotal evidence suggesting that partial credit guarantees allocated through private financial institutions generate loans that are more efficient than loans directly issued by the government.

Partial credit guarantees are designed under the premise that the lack of collateral can reduce access to finance for small and medium size entrepreneurs, thus reducing entrepreneurial activity. This would happen if banks were reluctant to grant loans to entrepreneurs with low collateral, or if the availability of collateral affected the size or maturity of the loans. However, it is unclear whether the lack of collateral is in fact a barrier to finance. After all, money is fungible, and banks could use other strategies to overcome the costs associated with issuing loans to low collateral entrepreneurs. On the other hand, it is unclear that loan guarantees will alleviate the problems associated with low collateral borrowing. First, banks could use the guarantees to insure loans that would have been issued even in the absence of insurance. Second, guarantees could reduce the incentives of entrepreneurs to exert effort and thereby potentially reducing entrepreneurial activity and/or entrepreneurs' productivity.

In this chapter we use the implementation of a partial credit guarantee intervention in Chile during the years 2003 to 2006 to study how partial credit guarantees affect entrepreneurs' incentives and access to finance. We also study whether partial credit guarantees distort the incentives of financial institutions. The novelty of our approach is that we use a nonlinearity in the allocation of insurance to identify the effect that the intervention has in terms of amount, size and default rate of insured loans. To complement the analysis we also compare the repayment behavior of insured entrepreneurs to the repayment behavior of uninsured entrepreneurs. We study whether entrepreneurs that hold both insured and uninsured loans show a different repayment behavior on their insured loans compared to their repayment behavior on their uninsured loans. Finally we study how the presence of credit insurance affects the credit capacity of individual entrepreneurs, holding assets fixed.

The data used in this study were collected from three different databases. The first database is from the credit insurance administrator which contains micro level data on the identities of the entrepreneurs that received insured loans, the date each insured loan was issued, the identity of the institution granting the loan and the fraction of the principal that is insured. We also extracted from the credit insurance administrator the total amount of insurance requested by each financial institution in each period, and the amount of insurance allocated to each financial institution in each period. These two amounts differ when the total amount of insurance allocated by the government in a particular period is smaller than the aggregated insurance amount requested by all financial institutions.³ The second database is from the

³When the total amount of insurance assigned by the government in a particular period of time is smaller than the aggregated insurance amount requested by each financial institution, the insurance funds are allocated through

bank regulation office and contains the total amount of credit that each entrepreneur maintains with every financial institution, the use of this credit (commercial, consumption or mortgage), and the information on missed or late payments.⁴ The third source of data used in this study is the database of the Chilean Tax Revenue Office. We use a sub-sample of this database containing the yearly sales and yearly assets of each formal business operating in the Chilean Economy.⁵

We first study the effect that an increase in the total insurance allocated to a particular financial institution has on the number of loans issued, the average loan size and the default rate of its loan portfolio. We show that increasing the amount of insurance allocated to particular financial institutions increases the total number of loans and aggregated loan amount issued to small and medium size entrepreneurs. Increasing the total amount of insurance allocated to a particular financial institution also increases the default rate of the institutions' loan portfolio. In particular, we show that a 100% increase in the amount of insurance allocated to a financial institution increases its portfolio's default rate by 1.5%. It is important to note that even though the intervention in Chile is intended to target new businesses, we find that increasing the amount of insurance allocated to a financial institution increases the number and aggregated loan amount for new loans as well as the number and aggregated loan amount for renewed loans.

Second, we study how credit insurance affects the repayment behavior of clients having insured and uninsured loans in the same bank and the repayment behavior of clients having insured and uninsured loans in different banks. We find no significant difference between the default rate of insured loans and the default rates of uninsured loans held by the same client in different banks. However, we find a strong and significant difference between the default rates of insured loans and the default rates of uninsured loans held by the same clients in the same bank. Specifically, clients holding insured and uninsured loans in the same bank have a 1.6% higher default rate on their insured loan one year after the loan is issued and a 5% higher default rate on their insured loan two years after the loan is issued, both estimations significant at the 1% level. If the difference in repayment rate was explained by a change in the clients' incentives, we should observe a difference in the repayment behavior on insured loans compared to the repayment behavior on uninsured loans regardless of whether the loans are held in the same or in different banks. However, if the difference in repayment rate was explained by a change in the banks' incentives, we should only observe a difference in the repayment rate between insured and uninsured loans held in the same bank.⁶ Therefore the evidence

a bidding system. In the bidding process financial institutions request an insurance amount and the fraction of the principal they want to be covered for their insured loans. The institution requesting the lowest fraction of insurance has priority over other institutions to get insurance funds, in the event of a tie the funds are allocated pro-rata at the requested insurance amount. Complete details on this bidding process can be found in the description of the intervention in Chapter 3.1.1.

⁴Information on arrears is divided into categories of no missed payments, payments in arrears for less than 30 days, payments in arrears between 30 and 59 days, and payments in arrears for 60 days or more.

⁵To comply with the Chilean law on information disclosure all the identification numbers were replaced by random numbers

⁶In this statement we are assuming that banks will not be able to affect the repayment behavior of its clients on their loans with other banks.

in this analysis suggests that partial credit insurance negatively affects the banks' incentives but not the entrepreneurs' incentives.

Third, we study how banks allocate insurance among their clients. To do this we construct two groups of entrepreneurs. The first group consists of entrepreneurs that have insurance on their commercial loans and the second group consists of entrepreneurs that do not have insurance on their commercial loans. It is important to note that insurance can only be allocated to commercial loans and therefore all consumption loans are uninsured. We first compare the difference in the default rate on commercial loans for the group of clients that have insurance on their commercial loans with the default rate on commercial loans for the group of clients that do not have insurance on their commercial loans. Second, we compare the difference in the default rate on consumption loans for which neither group has insurance. By comparing the default rate on consumption loans, which are uninsured for both groups, we can get an estimation of the default rate between the two groups in the absence of insurance. We find that one year after the loans are issued the default rate on commercial loans is 1.9% higher for the group of entrepreneurs that have insurance on their commercial loans, and that two years after the loans are issued the default rate is 4.2% higher for this group of entrepreneurs. However, we find no significant difference between the two groups in their default rate on consumption loans.

The finding that the default rate on uninsured loans is not different between the two groups suggests that the two groups are equally risky. In turn this shows that the screening efforts of the banks are similar for both insured and uninsured clients. However the difference in the default rate on commercial loans suggests that either the level of effort put forth by the entrepreneurs after the loans are issued is distorted by the insurance, or that the monitoring effort of the banks is distorted by the insurance, or both. Formerly we presented evidence suggesting that credit insurance does not affect entrepreneurs' incentives, therefore the difference in default rate on commercial loans between insured and uninsured clients should be explained by misalignments in the banks' incentives. Given the evidence that screening incentives are not affected by the presence of credit insurance, we conclude that the difference in default rates between insured and uninsured commercial loans is most likely explained by misalignment in the banks' monitoring incentives.

Finally we study how the presence of insurance affects the average loan size of entrepreneurs getting new loans. We find that the presence of insurance increases the average loan size for clients in the fifth asset decile by 125%. The increase in loan size as a fraction of assets is 87%, 69%, 55% and 34% for businesses in asset deciles 6, 7, 8 and 9 respectively.⁷ The effect of insurance on the size of renewed loans is smaller but still significant.

In conclusion, the findings in this chapter suggest that credit insurance is an effective mechanism to increase the loan capacity and the total amount lent to small and medium size entrepreneurs. Credit insurance does not significantly affect the repayment incentives of the entrepreneurs, but it does strongly reduce the banks' incentives to monitor.

⁷Clients in loan deciles 1, 2, 3, 4 and 10 were excluded from this analysis due to data limitations.

The rest of the chapter is organized as follows. In section 3.2 we give a brief description of the related literature, in section 3.3 we describe the institutional details of the partial credit guarantees intervention in Chile and the details of the data, in section 3.4 we explain our methodology, in section 3.5 we present the results, and in section 3.6 we discuss our results and conclusions.

3.2 Related Literature

The impact that initial capital has on entrepreneurial activity is an area of great debate. Evan and Jovanovic (1989), show that initial capital has an important effect on entrepreneurial activity. In their study they argue that wealthier people are more inclined towards being entrepreneurs and reject the explanation that the wealthy tend to make better entrepreneurs. In particular, they show that a person cannot use more than 1.5 times his or her initial wealth to start a business. Supporting Evan and Jovanovic's conclusions, Holtz-Eakin, Joulfaian and Rosen (1994a) study a group of entrepreneurs who received inheritances, and show that the businesses of these entrepreneurs have higher probability of survival than similar businesses of entrepreneurs who did not receive an inheritance. In a closely related study Holtz-Eakin Joulfaian and Rosen (1994b) show that individuals who receive an inheritance experience a substantial increase in their probability of becoming an entrepreneur and in the amount of capital employed in their new ventures. Even though most studies agree that liquidity constraints are binding for startup activities, there is still no consensus. For example, Cressy (1996) argues that the true determinant of a businesses' survival is human capital, and that the correlation between financial capital and survival is spurious, using data from UK startups to support his statement.

Nevertheless, the strong evidence that liquidity constraints are binding has motivated governmental interventions in the forms of direct loans to entrepreneurs and indirect subsidies allocated through private financial institutions. A widely used intervention in the financial markets are credit guarantees, however the effectiveness of these type of intervention is still unclear (see Honohan 2008 for details). Credit guarantee interventions are based on the idea that entrepreneurs with low collateral may be denied access to formal financial markets or have reduced credit capacity, even if they have profitable investment projects (see Berger Espinosa-Vega Frame and Miller 2005). Credit guarantee schemes address this problem by paying banks' a fraction of the principal's repayment in the event of default, reducing the banks' risk exposure, and as a consequence reducing the collateral requirements. However, collateral plays multiple roles in the financial market other than reducing the risk for the lender. In particular, it affects creditors' incentives to screen and monitor entrepreneurs' projects, and it also affects entrepreneurs' investment decisions. These distortions can potentially offset any benefits arising from the improvement in the entrepreneurs' access to finance.

There is a limited literature that studies the role that collateral plays in borrowing. Rajan and Winton (1995) find that collateral and covenants increase the incentives of banks to monitor firms, because the effective priority when the loan is collateralized is contingent on monitoring. Bester (1985 and 1987) shows

that collateral can be used by financial intermediaries to screen risky clients. In Bester's model, entrepreneurs have private information about the riskiness of their project and therefore low risk entrepreneurs prefer an increase in the collateral requirements rather than an increase in the interest rate. By simultaneously offering contracts with fixed interest rates and collateral requirements, the financial institutions can screen high risk entrepreneurs from low risk entrepreneurs, thereby reducing the liquidity constraints associated with asymmetric information. While Bester's model is based on asymmetric information, it does not study the potential moral hazard problems associated with collateral. Manove, Padilla and Pagano (2001) develop a model with two different types of entrepreneurs, those with a high probability of selecting a profitable business and those with a low probability of selecting a profitable business. In their model the bank has expertise in screening these two types of entrepreneurs and the bank has to choose the level of effort it wish to put in the screening process. In Monove et al. the absence of restrictions on the amount of collateral that the creditors' can request from the debtor can lead to an inefficient level of screening.

Berger and Udell (1989) present empirical evidence suggesting that collateral is most often associated with riskier borrowers, however they do not identify whether the riskiness is associated with the entrepreneurs' investment decision, the banks' screening process or the levels of effort exerted by the entrepreneur and-or the creditors after the investment decision is made.

The intrinsic endogeneity of the decision of creditors to request collateral and the decision of debtors to pledge collateral makes it difficult to empirically study the effect of partial credit guarantees on the entrepreneurs' liquidity constraints, the entrepreneurs' incentives, and the creditors' incentives. Our work sheds light on some of these questions by studying a governmental intervention in Chile that exogenously affected the credit availability and level of collateral requested by banks to low wealth entrepreneurs.

3.3 Description of the Intervention and Data

3.3.1 Description of the Intervention

The Partial Credit Guarantee Fund in Chile is administrated by a governmental agency. It has a capital of 60 million dollars, which can be levered up to 10 times according to the current law. Therefore the administration can allocate insurance funds for a total of 600 million dollars.

Between January 2003 and September 2006 (the period of analysis) approximately 100,000 operations were insured and the average fraction of the principal that was insured was 68%. The average amount for these loans was 15,000 dollars and the average maturity was 22 months. The maximum maturity, established by law, is 120 months.

The administrator of the Credit Guarantee Fund distributes the insurance funds among the financial institutions through a sealed bid auction, explained at the end of this chapter. The financial institutions can freely allocate the insurance among their clients, subject to satisfying the following restrictions:

- Insurance cannot be allocated to loans that have already been issued.

- Only loans below US\$ 200,000 can be insured
- The maximum coverage ratio for loans below US\$ 120,000 is 80%
- The maximum coverage ratio for loans above US\$ 120,000 is 50%
- Clients getting insurance cannot have payment in arrears in the financial system at the time the insured loan is issued
- Only clients with sales below US\$ 1,000,000 can get insured loans

The administrator charges a fee for the insurance, dependent on the past default rate insured loans have at each institution. Therefore the fee can vary across financial institutions but can not exceed 2%. Although the administrator reserves the right to not allocate insurance funds to institutions that present excessively high default rates.

There are three types of insurance offered by the fund: insurance for working capital, insurance for short term investment, and insurance for long run investment. The insurance for working capital can only be allocated to credit lines. The insurance for short term investment can be allocated to loans with a maximum maturity of 36 months. The insurance for long term investment can be allocated to loans with a minimum maturity of 37 months and a maximum maturity of 120 months. In the first part of this study (tables 4 and 5) we only focus on the insurance for long term investment, which represent 12% to 24% of the operations depending on the year.⁸

Currently there are 17 institutions that use credit insurance, however the 5 biggest financial institutions account for 90% of the insured loans. In the present study we only use data from these 5 institutions.

The following table presents the number and amount of operations by year and the percentage of long run investment loans.

year	operations	amount in \$ millions	mean in US\$	Long term loans loans
2001	2228	16	7405	13%
2002	28924	227	7864	12%
2003	30867	310	10032	12%
2004	34683	431	12433	15%
2005	33030	468	14173	22%
2006	25673	448	17466	24%

We can see that the loan administration guarantees approximately 30,000 loans per year. The average size of these insured loans has been increasing over time reaching a maximum of \$ 17,466 in 2006. Between 12% and 24% of the insured loans are long term investment (maturity longer than 36 weeks).

⁸The reason for focusing only on insurance for long term investments is that given data limitations it is difficult to distinguish a credit line from a loan for short term investment, making the analysis of these type of insurance problematic.

The allocation of the insurance funds across financial institution is made through a sealed bid auction. There are separate auctions for each type of insurance (working capital, short term investment and long term investment). In each auction the insurance administration offers a certain amount of insurance to be allocated across all the financial institutions. Each financial institution bids for an amount of insurance funds together with the fraction of the principal they want to be repaid by the insurance administration for the defaulted loans. Institutions asking for a lower fraction of the principal to be repaid have priority over other institutions in receiving insurance funds. In the event of a tie in the fraction of the principal institutions request to be repaid, the tied institutions receive insurance funds pro rata at the requested insurance amount. In the event that the amount offered by the insurance administration is larger than the aggregated amount requested by all financial institution, all institutions receive 100% of the requested amount. In table 3.1 we present the results for the auction of long term investment insurance during years 2003 to 2006. In the odd rows we present the fraction of the principal that institutions requested to be repaid by the insurance administration for the defaulted loans. In the even rows we present the amount of funds allocated to each financial institution as a fraction of the amount requested by each institution. For example on 06/19/03 all institution requested 80% of the principal to be repaid by the insurance administrator for the defaulted loans, as a consequence all institution were allocated 61% of the amount of insurance funds they requested. On 09/01/05 institution 1 requested 69% of the principal to be repaid for the defaulted loans, while the rest of the institutions requested 70% of the principal to be repaid, as a consequence institution 1 received 100% of the funds it requested while the other institutions received 8% of the funds they requested. On 11/01/05 institution 1 requested 67% to be repaid for defaulted loans, institution 2 requested 60% to be repaid for defaulted loans, institution 3 requested 65%, institution 4 requested 70%, and institution 5 requested 67%. As a consequence institutions 1, 2, 3, and 5 got 100% of the amount they requested while institution 4 got 7% of the amount it requested.

All the insurance funds have to be used before the next auction. Institutions that by the time of the next auction have not used all the funds they were allocated in the previous auction are limited in the amount of insurance funds they can request, this limit is equal to the amount they actually used. This constraint was implemented by the insurance administration to discourage financial institutions from bidding for more funds than what they are planning to use.

3.3.2 Data

The data used in our study was gathered from 3 different databases. The first database is from the credit insurance administrator which contains the identities of the entrepreneurs getting insured loans, the date when each insured loan was issued, the identity of the institution issuing the loan, the total amount of insurance requested in each auction by each financial institution, and the amount of insurance allocated in each auction to each financial institution. As stated in the last section, these amounts differ when the total amount of insurance distributed by the insurance administration in the auction is smaller than the aggregated

insurance amount requested by all financial institutions. This data is sent by the financial institutions to the insurance administration in a monthly basis. Failure to file this information for a particular loan disqualifies the financial institution from getting the principal repaid by the insurance administration in the event that the loan defaults.

The second database is from the bank regulation office which contains the size of the credit each entrepreneur maintains with each financial institution, use of the credit (commercial, consumption or mortgage), and information on missed payments,⁹ This information has to be sent to the bank regulation office on a monthly basis. Failure to file this information can result in fines. The bank regulation office uses this information to monitor the financial risk of each financial institution, and to control that financial institutions satisfy the capital requirement established by the Chilean bank law.

The third database is a subset of the database from the Chilean Tax Revenue Office containing; yearly sales and yearly assets by entrepreneur.¹⁰ This information was constructed from the sales tax and personal tax information filed by each company to the tax revenue office.

In table 3.2 we present the total number of companies that received loans in the Chilean financial system from 2003 to 2006 and divide our sample into new loans and renewed loans (loans issued before the expiration of a preexisting loan). For each type of these loans we present the number of insured loans and the number of uninsured loans. We observe that credit insurance was widely used by Chilean firms from 2003 to 2006. On average 19% of firms getting new loans used credit insurance while 15.5% of companies renewing preexisting loans used credit insurance. Firms in the first and last asset decile on average used less insurance than companies in the other asset quintiles. This is most likely because firms in the upper asset decile have sales above US\$ 1,000,000 a year and therefore do not qualify for insurance. It is somewhat puzzling that firms in the lowest asset quintile do not use insurance as intensively as other quintiles. A potential explanation may be that the fixed costs of using insurance for these loans is higher than the benefit of using insurance and therefore banks prefer to issue small loans without insurance.

In table 3.3 we present the mean and median asset amount and loan amount by asset decile, and the debt/asset ratio.¹¹ We observe that there is a strong correlation between asset size and credit size. We also observe that companies with less assets have a higher debt/asset ratio. Finally we observe that companies renewing their loans have higher debt/asset ratio, suggesting that companies can obtain larger loans when they have a longer relationship with the lender.

In table 4 we present the default rate on commercial loans by asset decile, one and two years after the loans are issued. We also present the default rate on consumption loans issued to the owner of the company.¹²

⁹Information on arrears is divided into categories of no missed payments, payments in arrears for less than 30 days, payments in arrears between 30 and 59 days, payments in arrears between 60 and 89 days, and payments in arrears for 90 or more days.

¹⁰To comply with the Chilean law on information disclosure, all the identification numbers were replaced by random numbers

¹¹The debt/asset ratio is evaluated using debt and asset median.

¹²Only when the owner owns 100 % of the company

We observe that default rate for commercial loans one year after the loan is issued is 2.61% for new loans and 2.69% for renewed loans. The default rates for consumption loans one year after the loan is issued is 4.67% for new loans and 4.8% for renewed loans. The default rate for commercial loans two years after the loan is issued is 4.54% for new loans and 4.99% for renewed loans while for consumption loans the default rate after two years is 4.22% for new loans and 4.47% for renewed loans. It is interesting to note that the default rate on consumption loans is similar one and two years after the loan is issued, while the default rate on commercial loans is significantly higher after two years.

3.4 Methodology

In tables 3.5 and 3.6 we estimate the effect of credit insurance on the total number of loans, loan amount and aggregated default rate. Because the amount of insurance allocated to each financial institution depends on the amount of insurance it requests, we cannot estimate the effect of credit insurance by regressing the dependent variables on the allocated insurance. To partially solve this problem we implement a two stage estimation. In the first stage we estimate the amount of insurance allocated to each financial institution as a function of the amount of insurance requested by each financial institution. In the second stage we estimate the number of loans, total loan amount and aggregated default rate as a function of the residual of the first estimation.

In order to understand the result of the second stage we have to understand the meaning of the residuals of the first stage. In the first stage we estimate the amount of insurance allocated to each financial institution as a function of the amount of insurance requested by each financial institution. If we assume that each institution expects to get a fraction of its requested amount, then we can interpret the residual of the first estimation as the "unexpected" amount of insurance received by each institution in each auction. Therefore in the second stage estimation, we get an approximation of the effect of an increase/decrease of the credit insurance amount on the variables under analysis.

It is important to understand the limitation of this approach. The amount of insurance allocated to each financial institution does not only depend on its requested insurance amount. As we previously discussed the amount of insurance allocated to each financial institution also depends on: the fraction of the principal they request to be paid in the event of default, the fraction of the principal that other institutions request to be repaid, and the amount of credit insurance that other institutions request from the insurance administration. Furthermore because the insurance is allocated through a sealed bid auction the participant can implement complicated dynamic strategies and therefore a linear estimation like the one implemented in the first stage is probably not going to capture all the relevant information. It is important to keep in mind these limitations when interpreting the results obtained in tables 4 and 5.

In tables 3.7 to 3.10 we estimate the effect of credit insurance on an individual's default rate. We do this by studying how default rate varies in the presence of partial credit insurance. The novelty of our

analysis in these tables is that instead of comparing the repayment behavior of entrepreneurs with insurance to the repayment behavior of entrepreneurs without insurance, we compare the repayment behavior of the same entrepreneurs on insured and uninsured loans. By comparing loans held by the same entrepreneurs, we address the omitted variables problem that arises when comparing different individuals. We do this by studying two different situations. In tables 3.7 and 3.8 we study entrepreneurs that have two commercial loans in different banks, one of the loans is insured while the other one is not. Because the two loans are issued by different and independent banks, changes in repayment behavior could be attributed to changes in the client's incentives to repay each loan. In tables 3.9 and 3.10 we study entrepreneurs that have two different loans in the same bank, one of the loans is insured while the other is not. In this case the banks are the same for both loans, and therefore a difference in the repayment behavior can potentially be explained by a difference in the bank's incentives to enforce the repayment of one loan over the other.

In table 3.11 we estimate the difference in default rate between insured and uninsured clients, as we stated in the former paragraph this analysis is prone to have omitted variables biases. We address this problem in two ways. First, we control for all the observables in the database. Second, we conduct a robustness check (in tables 3.13 and 3.14) to test whether insured clients are different from uninsured clients. Finally in table 3.12 we study how insurance affects the size of commercial loans. We do this by comparing the loan size of entrepreneurs with insured commercial loans to the loan size of entrepreneurs with uninsured commercial loans. This analysis is also prone to omitted variables and we address this problem in the same way as we do it for the results in table 3.11.

Tables 3.13 and 3.14 contain robustness checks for the analysis in tables 3.11 and 3.12. In table 3.13 we study the default rate on consumption loans (which do not qualify for insurance), between two different groups: clients that have insurance on their commercial loans and clients that do not have insurance on their commercial loans. If clients with insured commercial loans were significantly different from clients with uninsured commercial loans, we should still observe a difference in the default rate on their consumption loans. However if both groups were similar we should not observe differences in their default rate on consumption loans.

In table 3.14 we compare the size of the consumption loans of the same two groups used in table 3.13. Similarly to table 3.13, if the two groups were different we should observe a difference in the average consumption loan size between the two groups. On the contrary, if the groups were similar, the size of their consumption loans will not necessarily be similar. These two tables help to rule out potential selection biases in the analysis in tables 3.11 and 3.12.

3.5 Results

In table 3.5 and 3.6 we present the effect of an increase/decrease in the availability of credit insurance on the number of loans, loan amount and default rates. In table 3.5 we present the effect of credit insurance on

new loans, while in table 3.6 we present the effect of credit insurance on renewed loans. We observe in table 3.5 that an increase in the availability of credit generates a significant increase in the number of new loans issued by each financial institution. We also observe that an increase in the availability of credit insurance generates a significant decrease in the average loan size of new loans. While an increase in the availability of insurance does not affect the probability of loan default after 1 year, it significantly increases the probability of default after 2 years. In fact, a 100% increase in the availability of credit insurance generates a 1.7% increase in the average default rate of new loans after 2 years, significant at the 5% level.

In table 3.6 we observe that an increase in the availability of credit insurance also generates an increase in the number of renewed loans, however for these type of loans the availability of insurance does not affect the average loan size. The availability of insurance is also associated with higher default rates both 1 and 2 years after the loans are issued, however only the increase in the default rate after 2 years is statistically significant. Specifically, an increase of 100% in the availability of credit insurance generates an increase of 1.43% in the average default rate of renewed loans.

In table 3.7 and 3.8 we present the difference in default rates between insured and uninsured loans held by the same entrepreneurs in different financial institutions. In table 3.7 we present the difference in the default rate of the loans one year after the insured loan was issued while in table 3.8 we present the difference in default rate 2 years after the insured loan was issued. In table 3.7 we observe that there is no significant difference in the default rate of insured loans compared to the default rate of uninsured loans 1 year after the insured loan was issued. We also observe in table 3.7 that entrepreneurs tend to default more on big loans. We observe that when the uninsured loan represents more than 90% of the total loan the default rate on this loan is 2.4% higher than the default rate on the insured loan (see second line in table 3.7). However, when the insured loans represent more than 90% of the total loan the default rate is 1.8% higher for the insured loan (see last line in table 3.7). A similar but milder effect is observed when the insured/uninsured loan represents between 80% and 90% of the total credit. When we estimate a weighted average for the difference in default rates (as a matching estimation with equal weights for different insurance over total loan ratios) we find no significant difference in default rates. In table 3.8 we present the difference in default rate between uninsured and insured loans two years after the insured loan was issued. The results in table 3.8 do not differ significantly from the results in table 3.7.

In tables 3.9 and 3.10 we present the difference in default rates between insured and uninsured loans held by the same entrepreneurs in the same bank. In table 3.9 we present the difference in default rate one year after the insured loan was issued while in table 3.10 we present the difference in default rate two years after the insured loan was issued. In table 3.9 we observe that the default rate on insured loans is significantly higher than the default rate on uninsured loans. However this result does not hold when the uninsured loan is significantly bigger than the insured loan. In particular, when the insured loan represents less than 40% of the loan (lines 2 and 3 in table 3.9) the difference in the default rate is not significant, when the size of the insured loan represents between 40% and 50% of the total loan the default rate on insured loans is 3.5%

higher than the default rate on uninsured loans, however this result is significant only at the 10% level. The difference in default rates when the insured loan represents between 50% and 60% of the total loan is positive but not significant. Finally, when the insured loan represents more than 60% of the loan, the difference is positive and significant at the 1% level (2.5% when the insured loan represents between 60% and 80% of the total loan and 2% when the insured loan represents more than 80% of the total loan).

The results in table 3.10, are more pronounced than the results in table 3.9. In particular the difference in default rate after 2 years, presented in this table, is significantly higher for the insured loans even when the insured loan represents a small fraction of the total loan. In particular when the insured loan represents less than 20% of the total loan, its default rate is already higher than the default rate of uninsured loans by 3.8%, when the insured loan represents between 20% and 40% of the total loan the difference is positive but not significant. Finally when the insured loan represents more than 40% of the total loan its default rate is more than 6% higher than the default rate of uninsured loans.

In table 3.11 we compare the default rate of clients with insured loans to the default rate of clients with uninsured loans. Columns 1 and 3 present the results without controlling for the total assets while columns 2 and 4 present the results controlling for total assets. We observe that one year after issuance clients with insured loans have a 1.9% higher default rate than client with uninsured loans, but this result is not homogeneous across financial institutions. Institutions 3 and 4 do not present higher default rate for insured loans after one year. After two years of issuance the effect of insurance on the default rate becomes stronger at 4.2%, and is present in 4 out of 5 of the financial institutions under analysis. Financial institution 5 presents the highest difference in default rate between insured and uninsured loans; 8.6% (4.4% higher than the average for other institutions).

In table 3.12 we compare the loan size of clients getting insured loans to the loan size of clients getting uninsured loans, controlling for their total assets. Columns 1 and 3 present the results without controlling for sales amount while columns 2 and 4 present the results controlling for sales amount. We observe in the second column of table 3.12 that clients with the same level of assets on average receive 3.6 million Chilean pesos (about \$7,200) more on new loans when they have credit guarantee, the difference increases to 3.8 million Chilean pesos (about \$7,600) for renewed loans. This represents an increase of 125% for new loans and 85% for renewed loans.¹³ We also observe that the increase is consistent across different financial institutions (see columns 2 through 5). The relative magnitude of the effect decreases in total assets. For example for new loans the increase in loan size generated by the presence of insurance represents 87%, 69%, 55% and 34% for businesses in the 6th, 7th, 8th and 9th asset decile.

In table 3.13 we compare the default rate on consumption (uninsured) loans between clients with insured commercial loans and clients with uninsured commercial loans. Columns 1 and 3 present the results without

¹³These percentages are evaluated for the benchmark asset decile, which for this estimation is the fifth asset decile. The reason we chose this decile is that sales and assets were not consistently available at the Tax Revenue Office for lower deciles making the estimation unfeasible.

controlling for the total assets while columns 2 and 4 present the results controlling for total assets. We observe that the difference in default rate on consumption loans is not statistically different. This finding is consistent across financial institutions, the only exception is the default rate after 1 year for institutions 3 and 4, for which the default rate of consumption loans is lower for clients that have insured commercial loans (2% lower for financial institution 3 and 1.2% lower for financial institution 4).

Finally in table 3.14 we compare the loan size of consumption loans between clients that get insured commercial loans and client that get uninsured commercial loans. We can see that the presence of insurance reduces the size of consumption loans, but this decrease is only significant at 10% level for renewed loans and is not significant for new loans. The only exception is financial institution 4 where the presence of insurance on the commercial loan generates a reduction in the consumption loans that is significant at the 5% level.

3.6 Discussion and Conclusions

The results in this chapter show that partial credit guaranties have been effective in increasing the number of loans and the credit capacity of small and medium size entrepreneurs in Chile. However, partial credit guaranties also present serious costs. The default rate of a guaranteed loan can be as much as 8% higher than the default rate of similar non-insured loan. We show that the main reason for the higher default rate of insured loans is due to misalignments in the incentives for banks to monitor their insured clients. In particular, we show that clients holding both insured and uninsured loans in different banks do not show a significant difference in their default rate on their uninsured loans compared to the default rate on their insured loans. We also show that entrepreneurs whose commercial loans are insured do not show a higher default rate on their consumption (uninsured) loans compared to the default rate on consumption loans of entrepreneurs who have uninsured commercial loans. These two findings suggest that insurance does not affect the repayment behaviors of entrepreneurs. Nor does insurance affect the screening effort of banks. However, we show that clients with insured and uninsured loans in the same banks have a higher default rate on their insured loans compared to their default rate on uninsured loans. We also show that for the same levels of sales and assets, clients with insured commercial loans have a higher default rate on commercial loans than similar entrepreneurs with uninsured commercial loans. These two findings suggest that insurance seriously affect the banks' monitoring incentives causing banks to allocate less effort to collecting insured loans.

The former results are, in part, a consequence of the design of the intervention. The partial credit guarantee in Chile does not reduce the cost of default for the debtor. In particular, the borrowers are still liable for their loans, even after the insurance administrator repays the insured principal to the bank. Furthermore, reputational costs and costs of being in distress are faced by the entrepreneurs regardless of the presence of insurance. The only benefit the debtor gets from the availability of insurance is better access to finance; they do not get a reduction in the cost of default. On the contrary banks are guaranteed a fraction

of the principal in the event of a loan default, and therefore have fewer incentives to enforce repayment. In our opinion, the problem is that the credit being partial only aligns the screening incentives of the bank, but it does not align its monitoring incentives. In fact because the creditors assume a fraction of the risk, they have incentives to issue loans to the most profitable clients. However after a loan is issued the banks have more incentives to monitor uninsured loans.

This chapter shed important light on the effect that partial credit insurance has on small and medium size entrepreneurs' access to finance and default rates. It also explored the design of a partial credit insurance intervention in Chile, and the mechanisms through which this intervention increased the default rate on insured loans. This information can be used to improve the design of this type of instrument and to work to minimize economic distortions in future interventions.

Appendix

Table 3.1: Insurance Bidding Summary

In this table we present the results for the auction of long term investment insurance during years 2003 to 2006. In the odd rows we present the fraction of the principal that institutions requested to be repaid by the insurance administration for the defaulted loans. In the even rows we present the amount of funds allocated to each financial institution as a fraction of the amount requested by each institution.

date	inst. 1		inst. 2		inst. 3		inst. 4		inst. 5	
	insur	funds	insur	funds	insur	funds	insur	funds	insur	funds
03/31/03	80	98%	80	98%	80	98%	80	98%	80	98%
06/19/03	80	61%	80	61%	80	61%	80	61%	80	61%
09/22/03	80	47%	80	47%	80	47%	80	47%	80	47%
12/19/03	80	67%	80	67%	80	67%	80	67%	80	67%
03/31/04	70	100%	80	92%	80	92%	80	92%	80	92%
06/30/04	70	100%	80	81%	80	81%	80	81%	80	81%
09/30/04	70	100%	80	77%	80	77%	80	77%	80	77%
12/30/04	70	100%	80	61%	80	61%	80	61%	80	61%
04/01/05	70	100%	80	58%	80	58%	80	58%	80	58%
07/01/05	70	100%	80	12%	80	12%	80	12%	80	12%
09/01/05	69	100%	70	8%	70	8%	70	8%	70	8%
11/01/05	67	100%	60	100%	65	100%	70	7%	67	100%
01/02/06	60	100%	60	100%	65	100%	60	100%	65	100%
03/16/06	60	100%			65	100%	65	100%	65	100%
05/01/06	60	100%	80	100%	65	100%	70	100%	65	100%
07/01/06	63	100%	80	100%	80	100%	80	100%	70	100%
09/01/06	70	100%	80	100%	75	100%	80	100%	70	100%

Table 3.2: Total number of loans and fraction of insured loans by asset decile

assets decile	New loans			Renewals		
	number insured	number uninsured	percentage insured	number insured	number uninsured	percentage insured
1	227	2056	9.94	97	1867	4.94
2	512	2855	15.21	216	2545	7.82
3	911	3605	20.17	475	3432	12.16
4	1176	3930	23.03	595	3787	13.58
5	1525	4974	23.47	1000	5083	16.44
6	1786	5469	24.62	1461	5935	19.75
7	2467	7725	24.21	2704	8981	23.14
8	2728	8662	23.95	4013	11444	25.96
9	2684	11142	19.41	5468	16461	24.94
10	754	15708	4.58	1531	21984	6.51
Total	14770	66126	18.86	17560	81519	15.52

Table 3.3: Asset and Loan size by asset decile

assets decile	assets mean	assets median	new loans mean	new loans median	new loans debt/asset	renewals mean	renewals median	new loans debt/asset
1	418651	437330	1133284	528678	1.21	2291658	1101716	2.52
2	1088128	1072617	1832912	739966	0.69	2705884	1286932	1.20
3	2000714	1984510	1754369	1006439	0.51	3256116	1569968	0.79
4	3482489	3440462	2479385	1137867	0.33	3883440	2063487	0.60
5	6021888	5937404	2891127	1597175	0.27	4478587	2551202	0.43
6	10708119	10509000	4673525	2198077	0.21	6108851	3548844	0.34
7	20606730	20045244	6524384	3727262	0.19	8378088	5337472	0.27
8	47043424	44908328	9896918	6353064	0.14	12710665	9113570	0.20
9	148211840	133145872	20212892	13504230	0.10	24345006	16980800	0.13
10	29633228800	890374592	50508516	23484654	0.03	55494888	30724136	0.03

Table 3.4: Default rate by asset decile

assets	New loans				Renewals			
	com +1	com +2	cons +1	cons +2	com +1	com +2	cons +1	cons +2
1	3.08	3.88	5.75	4.93	2.90	4.70	8.01	7.72
2	3.09	4.28	8.65	7.00	2.54	2.79	8.71	5.22
3	3.35	4.10	6.18	5.94	3.22	4.55	8.30	4.14
4	2.98	4.28	6.44	5.36	2.92	4.81	5.22	5.52
5	3.36	5.29	7.44	5.48	4.10	6.44	5.66	4.29
6	3.34	5.90	3.39	3.38	3.35	6.89	4.21	5.33
7	3.12	6.78	2.84	4.10	3.27	7.37	3.49	4.94
8	2.04	5.55	2.87	3.52	2.54	6.51	2.35	3.59
9	1.29	3.93	1.62	1.70	1.51	4.22	1.38	2.43
10	0.43	1.41	1.52	0.76	0.56	1.59	0.66	1.56
average	2.61	4.54	4.67	4.22	2.69	4.99	4.80	4.47

Table 3.5: Effect of Changes in Availability of Credit Insurance on Number of loans, Loan Size and Default Rate of Small and Medium Size Businesses (New Clients)

In this table we present the change in the total number of issued loans, the average loan size, the default rate after one year and the default rate after two years for small and medium size businesses getting their first loan from the bank. We estimate this parameters by regressing the number of loans, average loan size and default rates, by institution, on the residuals of a first stage estimation of the credit insurance available to each institution. In the first stage, not presented, we estimate the credit insurance amount available to each institution as a function of the credit insurance amount requested by the institution. Because the allocation process is non lineal the residual of this estimation can be used as an instrument for the second stage presented in this table.

	Number of loans	Loan size	default(+1)	default(+2)
First stage residual	122.51** (57.55)	-1.333e+06*** (4.339e+05)	0.019 (0.301)	1.697** (0.705)
dummy institution = 2	-229.40*** (46.59)	6.663e+06*** (5.383e+05)	2.284*** (0.619)	4.148*** (1.078)
dummy institution = 3	-309.64*** (44.49)	8.035e+06*** (5.713e+05)	0.819** (0.345)	-1.510* (0.847)
dummy institution = 4	-254.98*** (44.32)	9.371e+06*** (5.511e+05)	0.814** (0.384)	3.187*** (0.928)
dummy institution = 5	54.60 (92.68)	2.52E+04 (6.525e+05)	0.243 (0.329)	0.693 (0.789)
Constant	369.67*** (37.15)	5.286e+06*** (2.867e+05)	0.691*** (0.226)	5.952*** (0.618)
Observations	224	224	224	224
Adjusted R-squared	0.2024	0.6224	0.0949	0.1390

Table 3.6: Effect of Changes in Availability of Credit Insurance on Number of lans, Loan Size and Default of Small and Medium Size Businesses for Renewed Loans

In this table we present the change in the total number of issued loans, the average loan size, the default rate after one year and the default rate after two years for small and medium size businesses renewing their loans. we estimate this parameters by regressing the number of loans, average loan size and default rates, by institution, on the residuals of a first stage estimation of the credit insurance available to each institution. In the first stage, not presented, we estimate the credit insurance amount available to each institution as a function of the credit insurance amount requested by the institution. Because the allocation process is non lineal the residual of this estimation can be used as an instrument for the second stage presented in this table.

	Number of loans	Loan size	default(+1)	default(+2)
First stage residual	84.39* (47.39)	-9.99E+04 (5.652e+05)	0.463 (0.714)	1.430* (0.808)
dummy institution = 2	-203.12*** (36.88)	1.784e+07*** (6.168e+05)	0.513 (1.027)	1.649* (0.930)
dummy institution = 3	-271.28*** (36.18)	1.773e+07*** (6.523e+05)	-1.025 (0.889)	-1.099 (0.769)
dummy institution = 4	-171.09*** (35.98)	2.027e+07*** (7.592e+05)	6.721*** (1.096)	5.160*** (0.872)
dummy institution = 5	9.66 (75.27)	2.694e+06*** (8.202e+05)	-2.456*** (0.892)	1.468* (0.805)
Constant	329.38*** (30.90)	5.658e+06*** (3.864e+05)	3.630*** (0.808)	6.675*** (0.588)
Observations	224	224	224	224
Adjusted R-squared	0.1677	0.8444	0.3752	0.2362

Table 3.7: Difference in Repayment Behavior Among Insured and Uninsured Loans Hold in Different Banks, measured after 1 year

In this table we present the difference in default rate on insured loans compared to the default rate of the uninsured loans hold by the same entrepreneurs in a different bank. We present the results by the importance of the insured loan, measured as a fraction of total loan amount. We observe that clients tend to default more on their bigger loans, however a matching estimation shows no statistical difference in the repayment behavior for insured loans compared to the repayment behavior of uninsured loans.

	$\beta_{insurance}$	std	C	std	Observations	Adj. R^2
matching estimation	-0.0024	(0.0019)	0.0452***	(0.0013)		
$0 \leq \text{ratio} < 0.1$	-0.0242***	(0.0077)	0.0423***	(0.0054)	1984	0.0045
$0.1 \leq \text{ratio} < 0.2$	-0.0173**	(0.0070)	0.0429***	(0.0050)	2660	0.0019
$0.2 \leq \text{ratio} < 0.3$	-0.0046	(0.0070)	0.0470***	(0.0050)	3446	-0.0002
$0.3 \leq \text{ratio} < 0.4$	-0.0069	(0.0068)	0.0527***	(0.0048)	4058	0.0000
$0.4 \leq \text{ratio} < 0.5$	-0.0004	(0.0059)	0.0445***	(0.0042)	4894	-0.0002
$0.5 \leq \text{ratio} < 0.6$	-0.0025	(0.0058)	0.0503***	(0.0041)	5602	-0.0001
$0.6 \leq \text{ratio} < 0.7$	0.0006	(0.0059)	0.0559***	(0.0041)	6192	-0.0002
$0.7 \leq \text{ratio} < 0.8$	0.0040	(0.0049)	0.0421***	(0.0035)	7078	0.0000
$0.8 \leq \text{ratio} < 0.9$	0.0092**	(0.0046)	0.0424***	(0.0032)	8496	0.0004
$0.9 \leq \text{ratio} \leq 1$	0.0182***	(0.0034)	0.0321***	(0.0024)	13322	0.0020

Table 3.8: Difference in Repayment Behavior Among Insured and Uninsured Loans Hold in Different Banks, measured after 2 years

In this table we present the difference in default rate on insured loans compared to the default rate of the uninsured loans hold by the same entrepreneurs in a different bank. We present the results by the importance of the insured loan, measured as a fraction of total loan amount. We observe that clients tend to default more on their bigger loans, however a matching estimation shows no statistical difference in the repayment behavior for insured loans compared to the repayment behavior of uninsured loans.

	$\beta_{insurance}$	std	C	std	Observations	Adj. R^2
matching estimation	-0.0024	(0.0031)	0.0875***	(0.0022)		
$0 \leq \text{ratio} < 0.1$	-0.0284**	(0.0136)	0.0806***	(0.0096)	1340	0.0025
$0.1 \leq \text{ratio} < 0.2$	-0.0331***	(0.0114)	0.0838***	(0.0080)	1934	0.0039
$0.2 \leq \text{ratio} < 0.3$	-0.0238**	(0.0115)	0.1003***	(0.0081)	2432	0.0014
$0.3 \leq \text{ratio} < 0.4$	-0.0170	(0.0111)	0.1044***	(0.0078)	2816	0.0005
$0.4 \leq \text{ratio} < 0.5$	0.0006	(0.0096)	0.0898***	(0.0068)	3540	-0.0003
$0.5 \leq \text{ratio} < 0.6$	0.0000	(0.0094)	0.0993***	(0.0066)	4050	-0.0002
$0.6 \leq \text{ratio} < 0.7$	0.0083	(0.0091)	0.0961***	(0.0064)	4350	0.0000
$0.7 \leq \text{ratio} < 0.8$	0.0034	(0.0078)	0.0862***	(0.0055)	5290	-0.0002
$0.8 \leq \text{ratio} < 0.9$	0.0347***	(0.0072)	0.0720***	(0.0051)	6278	0.0035
$0.9 \leq \text{ratio} \leq 1$	0.0309***	(0.0053)	0.0621***	(0.0038)	10020	0.0032

Table 3.9: Difference in Repayment Behavior Among Insured and Uninsured Loans Hold in the Same Bank, measured after 1 year

In this table we present the difference in default rate on insured loans compared to the default rate of the uninsured loans hold by the same entrepreneurs in the same bank. We present the results by the importance of the insured loan, measured as a fraction of total loan amount. We observe that there is a significant difference in the repayment behavior for insured loans compared to the repayment behavior for uninsured loans.

	$\beta_{insurance}$	std	C	std	Observations	Adj. R^2
matching estimation	0.0158***	(0.0032)	0.0312***	(0.0023)		
$0 \leq \text{ratio} < 0.2$	0.0122	(0.0121)	0.0061	(0.0086)	328	0.0000
$0.2 \leq \text{ratio} < 0.4$	-0.0041	(0.0176)	0.0412***	(0.0125)	486	-0.0020
$0.4 \leq \text{ratio} < 0.5$	0.0354*	(0.0184)	0.0276**	(0.0130)	508	0.0053
$0.5 \leq \text{ratio} < 0.6$	0.0068	(0.0139)	0.0408***	(0.0098)	882	-0.0009
$0.6 \leq \text{ratio} < 0.8$	0.0246***	(0.0069)	0.0369***	(0.0049)	3906	0.0030
$0.8 \leq \text{ratio} \leq 1$	0.0197***	(0.0024)	0.0343***	(0.0017)	30288	0.0023

Table 3.10: Difference in Repayment Behavior Among Insured and Uninsured Loans Hold in the Same Bank, measured after 2 years

In this table we present the difference in default rate on insured loans compared to the default rate of the uninsured loans hold by the same entrepreneurs in the same bank. We present the results by the importance of the insured loan, measured as a fraction of total loam amount. We observe that there is a significant difference in the repayment behavior for insured loans compared to the repayment behavior for uninsured loans.

	$\beta_{insurance}$	std	C	std	Observations	Adj. R^2
matching estimation	0.0515***	(0.0044)	0.0267***	(0.0031)		
$0 \leq \text{ratio} < 0.2$	0.0382*	(0.0225)	0.0153	(0.0159)	262	0.0072
$0.2 \leq \text{ratio} < 0.4$	0.0055	(0.0222)	0.0440***	(0.0157)	364	-0.0026
$0.4 \leq \text{ratio} < 0.5$	0.0695***	(0.0213)	0.0107	(0.0151)	374	0.0252
$0.5 \leq \text{ratio} < 0.6$	0.0556***	(0.0197)	0.0359***	(0.0139)	612	0.0113
$0.6 \leq \text{ratio} < 0.8$	0.0701***	(0.0090)	0.0265***	(0.0064)	2796	0.0209
$0.8 \leq \text{ratio} \leq 1$	0.0698***	(0.0033)	0.0279***	(0.0023)	21584	0.0206

Table 3.11: Effect of Insurance on the Default rate of Individuals' Commercial Loans

In this table we present the effect of insurance on the default rate of commercial(insurable) loans of small and medium size businesses. In the first and third columns we present a standard OLS estimation, while in the second and fourth column we present an OLS estimation controlling for the effect of assets.

	default(+1)		default(+2)	
dummy insurance	0.0156***	0.0186***	0.0416***	0.0422***
	[0.0060]	[0.0060]	[0.0100]	[0.0100]
dummy insurance x institution = 2	-0.0076	-0.0103	0.0177	0.0168
	[0.0081]	[0.0081]	[0.0130]	[0.0130]
dummy insurance x institution = 3	-0.0186	-0.0162	-0.0419**	-0.0380*
	[0.0121]	[0.0121]	[0.0199]	[0.0199]
dummy insurance x institution = 4	-0.0168**	-0.0166**	-0.0164	-0.0149
	[0.0075]	[0.0075]	[0.0119]	[0.0119]
dummy insurance x institution = 5	-0.0036	-0.0025	0.0429*	0.0442*
	[0.0165]	[0.0165]	[0.0236]	[0.0236]
default on commercial loans	0.3730***	0.3704***	0.2262***	0.2250***
	[0.0112]	[0.0112]	[0.0167]	[0.0167]
default on consumption loans	0.0864***	0.0836***	0.0937***	0.0921***
	[0.0106]	[0.0106]	[0.0174]	[0.0174]
Size of Commercial loan	-3.19e-10***	-1.73e-10**	-2.32e-10**	-8.94E-11
	[6.82e-11]	[7.12e-11]	[1.08e-10]	[1.13e-10]
Size of Consumption loan	3.73E-10	6.26e-10**	2.71E-10	4.54E-10
	[3.15e-10]	[3.16e-10]	[5.51e-10]	[5.53e-10]
Constant	0.0237***	0.0168***	0.0431***	0.0394***
	[0.0038]	[0.0039]	[0.0062]	[0.0063]
Assets Controls	×	√	×	√
Observations	26254	26254	20264	20264
Adjusted R-squared	0.0544	0.0567	0.0234	0.0241

Table 3.12: Effect of Insurance on the Size of Individual Commercial Loans

In this table we present the effect insurance on the loan size of small and medium size businesses. In the first and third columns we present a standard OLS estimation, while in the second and fourth column we present an OLS estimation controlling for the effect of sales.

	New loans		Renewals	
dummy insurance	3.74e+06***	3.60e+06***	3.99e+06***	3.84e+06***
	[7.47e+05]	[7.55e+05]	[1.04e+06]	[1.02e+06]
dummy insurance x institution = 2	-1.23e+06*	-1.21e+06*	2.89e+06***	2.68e+06***
	[6.66e+05]	[6.71e+05]	[8.51e+05]	[8.39e+05]
dummy insurance x institution = 3	-4.29E+05	-5.83E+05	1.86E+06	1.62E+06
	[1.01e+06]	[1.01e+06]	[1.30e+06]	[1.27e+06]
dummy insurance x institution = 4	-4.06E+05	-5.37E+05	-1.70E+04	-3.36E+05
	[5.93e+05]	[5.96e+05]	[8.26e+05]	[8.14e+05]
dummy insurance x institution = 5	-2.53E+05	-2.10E+05	1.62E+06	1.48E+06
	[1.98e+06]	[1.96e+06]	[1.63e+06]	[1.59e+06]
dummy insurance x assets = 2	4.50E+05	3.86E+05	1.01E+06	8.32E+05
	[8.29e+05]	[8.33e+05]	[1.23e+06]	[1.21e+06]
dummy insurance x assets = 3	9.22E+05	9.07E+05	6.03E+05	5.43E+05
	[7.78e+05]	[7.83e+05]	[1.13e+06]	[1.11e+06]
dummy insurance x assets = 4	1.81e+06**	1.85e+06**	1.98e+06*	1.72E+06
	[7.74e+05]	[7.80e+05]	[1.12e+06]	[1.10e+06]
dummy insurance x assets = 5	3.36e+06***	3.29e+06***	3.47E+05	1.70E+05
	[8.19e+05]	[8.25e+05]	[1.14e+06]	[1.12e+06]
default on commercial loans	-6.08E+05	-5.40E+05	8.29e+06***	7.91e+06***
	[1.68e+06]	[1.73e+06]	[1.54e+06]	[1.57e+06]
default on consumption loans	-1.80e+06***	-1.58e+06**	-2.69e+06*	-2.30E+06
	[6.97e+05]	[7.49e+05]	[1.41e+06]	[1.43e+06]
Constant	5.21E+05	9.65e+05***	6.78E+05	1.42e+06***
	[3.49e+05]	[3.74e+05]	[4.68e+05]	[4.94e+05]
Sales Controls	×	√	×	√
Observations	10506	9929	15556	14831
Adjusted R-squared	0.1153	0.1220	0.1322	0.1450

Table 3.13: Effect of Insurance on the Default rate of Individuals' Consumption Loans

In this table we present the effect of insurance on the default rate on consumption(uninsurable) loans for small and medium size businesses. In the first and third columns we present a standard OLS estimation, while in the second and fourth column we present an OLS estimation controlling for the effect of assets.

	default(+1)		default(+2)	
dummy insurance	-0.0026 [0.0055]	0.0019 [0.0055]	0.0013 [0.0074]	0.0035 [0.0074]
dummy insurance x institution = 2	0.0021 [0.0074]	-0.0018 [0.0074]	0.0151 [0.0096]	0.0133 [0.0096]
dummy insurance x institution = 3	-0.0215* [0.0111]	-0.0198* [0.0111]	-0.0267* [0.0147]	-0.0222 [0.0147]
dummy insurance x institution = 4	-0.0111 [0.0068]	-0.0118* [0.0068]	-0.0096 [0.0088]	-0.0082 [0.0088]
dummy insurance x institution = 5	-0.0058 [0.0150]	-0.0046 [0.0150]	-0.0026 [0.0175]	-0.0006 [0.0175]
0.0000				
default on commercial loans	0.0398*** [0.0102]	0.0361*** [0.0102]	0.0096 [0.0124]	0.0072 [0.0124]
default on consumption loans	0.0189* [0.0097]	0.0154 [0.0096]	-0.0162 [0.0129]	-0.0185 [0.0129]
Size of Commercial loan	-5.41e-10*** [6.22e-11]	-3.77e-10*** [6.48e-11]	-4.50e-10*** [8.01e-11]	-2.71e-10*** [8.39e-11]
Size of Consumption loan	6.64e-10** [2.87e-10]	9.72e-10*** [2.88e-10]	-4.66E-12 [4.08e-10]	2.77E-10 [4.09e-10]
Constant	0.0306*** [0.0035]	0.0214*** [0.0035]	0.0287*** [0.0046]	0.0222*** [0.0047]
Assets Controls	×	√	×	√
Observations	26254	26254	20264	20264
Adjusted R-squared	0.0063	0.0116	0.0032	0.0058

Table 3.14: Effect of Insurance on the Size of Individual Consumption Loans

In this table we present the effect insurance on the loan size of small and medium size businesses. In the first and third columns we present a standard OLS estimation, while in the second and fourth column we present an OLS estimation controlling for the effect of sales.

	New loans		Renewals	
dummy insurance	-5.58e+05*	-4.80E+05	-5.24e+05**	-4.21e+05*
	[3.23e+05]	[3.26e+05]	[2.31e+05]	[2.30e+05]
dummy insurance x institution = 2	-2.95E+05	-2.28E+05	-2.22E+05	-1.84E+05
	[2.88e+05]	[2.90e+05]	[1.89e+05]	[1.89e+05]
dummy insurance x institution = 3	6.64E+05	6.43E+05	1.68E+05	1.35E+05
	[4.37e+05]	[4.36e+05]	[2.90e+05]	[2.86e+05]
dummy insurance x institution = 4	-5.44e+05**	-5.56e+05**	1.96E+05	1.13E+05
	[2.57e+05]	[2.57e+05]	[1.84e+05]	[1.83e+05]
dummy insurance x institution = 5	2.10E+05	1.34E+05	9.85E+04	2.32E+04
	[8.55e+05]	[8.46e+05]	[3.63e+05]	[3.58e+05]
dummy insurance x assets = 2	1.53E+05	1.36E+05	4.13E+04	6.48E+04
	[3.59e+05]	[3.60e+05]	[2.74e+05]	[2.72e+05]
dummy insurance x assets = 3	-1.48E+05	-1.81E+05	-1.39E+05	-1.89E+05
	[3.37e+05]	[3.38e+05]	[2.52e+05]	[2.50e+05]
dummy insurance x assets = 4	9.78E+04	9.66E+04	-2.68E+05	-2.99E+05
	[3.35e+05]	[3.37e+05]	[2.49e+05]	[2.48e+05]
dummy insurance x assets = 5	-2.89E+05	-2.56E+05	-4.63E+04	-1.53E+05
	[3.54e+05]	[3.56e+05]	[2.54e+05]	[2.53e+05]
default on commercial loans	-6.57E+05	-8.21E+05	-3.30E+05	-5.32E+05
	[7.27e+05]	[7.46e+05]	[3.42e+05]	[3.53e+05]
default on consumption loans	8.15e+05***	7.85e+05**	1.36e+06***	1.29e+06***
	[3.02e+05]	[3.23e+05]	[3.14e+05]	[3.22e+05]
Constant	8.99e+05***	8.41e+05***	7.86e+05***	7.25e+05***
	[1.51e+05]	[1.62e+05]	[1.04e+05]	[1.11e+05]
Sales Controls	×	√	×	√
Observations	10506	9929	15556	14831
Adjusted R-squared	0.0872	0.0899	0.0906	0.0979

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