

THE EFFECT OF BANK MERGERS ON CREDIT AVAILABILITY AND FIRM PERFORMANCE: EVIDENCE FROM A NATURAL EXPERIMENT

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Abstract

We estimate the *ceteris paribus* effect of mergers, by studying a merger that is not caused by changes in economic conditions. Most firms borrowing from the banks that merge experience neither a reduction in their borrowing amount nor an increase in their probability to enter financial distress. Only firms borrowing from both of the banks that merge (“overlap” firms) experience a reduction in the amount lent by the merged bank. Large overlap firms borrow from other banks and offset this reduction. However, small overlap firms cannot borrow a sufficient amount from other banks, and they experience a temporary decrease in their overall borrowing and a temporary increase in their default rate as well. Firms borrowing from the banks that merge are more likely to miss payments but only in the short run. Overall, we find that mergers are innocuous in the long run, and have weak effects in the short run.

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THE NUMBER OF BANKS IN THE US during 1980-2003 decreased from about 16,000 to about 8,000. The most important cause for this reduction was the merger of healthy institutions (Pilloff, 2004). An important question that has emerged is how these mergers affect the borrowers of the bank. Many have argued that after a merger, the consolidated institution makes significant credit allocation changes. This can lead to large real effects if firms are unable to compensate changes in the amount lent by their banks. A complete understanding of how mergers affect credit requires estimating the banks' lending channel (i.e. the changes in credit allocation made by the consolidated institution), simultaneously with the firms' borrowing channel (i.e. the inability of firms to compensate changes in the amount lent by the merging banks by borrowing from other banks).

Early studies about mergers are based on aggregate data, and therefore do not make a distinction between the lending channel and the firm channel. The majority of papers based on aggregate data show that large banks favour lending to large companies, while small banks are more likely to lend to small business (Berger, Kashyap, Scalise, Gertler, and Friedman, 1995; Berger, Klapper, and Udell, 2001; Cole, Goldberg, and White, 2004). According to this strand of literature, a merger increases the size of the bank and reduces the lending to small borrowers. Nonetheless, some early studies already point out that mergers might have a reduced effect on credit allocation (Peek and Rosengren, 1998; Strahan and Weston, 1998), or that effects might be transitory (Berger, Saunders, Scalise, and Udell, 1998; Jayaratne and Wolken, 1999).

Recent lending data at the bank-firm level has become available, broadening the scope of the analysis of bank mergers. A prominent study using this type of data for the Italian financial markets, suggests that the extent to which a merger affects the cost of credit and the extensive margin of credit depends on the size of the firm and the availability of alternative sources of financing Sapienza (2002). Small firms with fewer financing alternatives experience the strongest change in credit availability and the highest increase in credit costs. Di Patti and Gobbi (2007) use similar data to study changes in the loan amount borrowed by each firm, and only find temporary reductions in credit availability borne by firms affected by the merger. More recently, Degryse, Masschelein, and Mitchell (2011) use Belgian data and find an important long term reduction in credit availability borne by firms initially borrowing from the target bank.

Consolidating the findings in previous studies is difficult given that the results are so diverse. However, the diversity of results is natural because the mergers studied take place in different circumstances. For example, some banks are acquired after a negative shock to their borrowers (Dymski, 1999). In such cases, we observe a “spurious” negative correlation between the merger and the performance of the borrowers of the target. However, other banks are acquired after a positive shock (Pilloff, 2004), which generates a “spurious” positive correlation. Some of these shocks are observed by the researcher and incorporated into the analysis, but in many cases these shocks are not observable and the “spurious” correlation is incorrectly considered a consequence of the merger. Furthermore, the effect

of the merger can be overstated if the clients with good investment opportunities anticipate the merger and migrate to other banks. On the other hand, the effects can be understated if the target tries to improve its portfolio before the merger by luring high quality borrowers.

To address potential biases we study a merger that is not caused by changes in the characteristics of the firms, and we construct the sample based on variables observed before the firms are able to anticipate the merger. In 2002, two Spanish banks merged their Chilean subsidiaries subsequent to the consolidation of their operations in Spain in 1999. Because the subsidiaries made up less than 1% of the value of the Spanish conglomerates, one can reasonably assume that the merger of the subsidiaries in Chile is a consequence of the merger in Spain and thus independent of the characteristics of the borrowers in Chile. Furthermore, the evidence in the paper shows that the merger was not anticipated by the firms in Chile as seen in figure 1. To make the analysis more robust, we use a window of time that starts before the merger in Spain takes place and ends almost two years after the consolidation was completed in Chile. To the best of our knowledge, we are the first to disentangle the effect of a merger from the effect of other changes in the economic conditions, which can be the very reason why banks merge in the first place. Furthermore, in our identification strategy, the ability of the firms to anticipate the merger and pre-sort does not bias the results.

Following the approach in Khwaja and Mian (2008), we study the impact of the merger on the firms that borrow from multiple banks before the merger. These firms make up 15%

of the total number of firms yet they account for 78% of the total borrowing in the financial market. We also provide an approximation of the effect of the merger on the firms' borrowing channel. Firms initially borrowing from one of the banks that merge (and from other banks that do not merge) neither have a change in the amount lent by the merged bank, nor have a change in the amount borrowed from other banks. Firms initially borrowing from both banks that merge-referred to as "overlap" firms henceforth- have a 20% reduction in the amount lent by the merged bank compared to the change in the amount lent by other banks. The magnitude of this reduction is independent of the firm's size. In the short run, large overlap firms borrow enough from other banks and offset this reduction, but small overlap firms experience a reduction in their number of lending relationships and total borrowing. In the long run, both large and small overlap firms borrow enough from other banks and offset the reduction in the amount lent by the merged bank.

We also study the effect of the merger on the extensive margin of credit. We find that overlap firms are less likely to end their relationship with the merged bank. While this result is consistent with previous findings, the effect is a consequence of how "exit" is measured in the literature and unrelated to changes in credit allocation (This is true not only in our setup but also in the setup of previous empirical work on the subject.).¹ We also observe that firms borrowing from the target, defined in the paper as the smallest bank in the

¹In most empirical studies, borrower i "exits" bank j at time t if the amount borrowed at time t is zero, and the amount borrowed at time $t - 1$ is larger than zero. For most firm-bank relationships, the earliest this can happen is when the loan reaches maturity; however, for "overlap"-merged bank relationship the earliest this can happen is when both pre-existing loans reach maturity which happens later on average.

merger, experience a small increase in the probability of being denied a loan (0.59%). This is consistent with the findings in Degryse, Masschelein, and Mitchell (2011).

The effect on the firms' performance is also minimal. Only small overlap firms have an increase in the probability of default to the merged bank within two years, but even these firms do not have a higher probability of default in the long run compared to similar firms borrowing from other banks. Furthermore, we do not observe a change in the sales level or the probability of going out of business for most of these firms. Only small overlap firms show a higher probability of shut down, and though this result is economically large, it is not statistically significant. On the downside, we observe that both small and large firms borrowing from either one or both banks in the merger experience an increase in the probability of missing a payment when the banks merge. However, in the long run, the probability of these firms missing a payment is not different from the probability of similar firms missing a payment to other banks. This finding suggests that the increase in the number of late payments is caused by a transitory reorganization of the operations of the merged bank and not by the economic distress of the firms exposed to the merger. One possibility is that the reorganization increases loan officer turnover and therefore reduces the monitoring of the loans which in turn deteriorates repayment. See Drexler and Schoar (2012) for evidence of this mechanism.

We then turn to the analysis of firms that borrow from only one bank. Following the methodology described in Degryse, Masschelein, and Mitchell (2011), we construct three

categories of firms based on their borrowing before and after the merger: the “STAY” category is comprised of firms that borrow from the same bank before and after the merger, the “SWITCH” category is comprised of firms that borrow from different banks before and after the merger, and the “DROP” category consists of firms that borrow from only one bank before the merger and do not have debt after the merger. We study whether the firms initially borrowing from the target or the acquirer are more likely to belong to one of these categories compared to similar firms initially borrowing from a bank that does not merge. While Degryse, Masschelein, and Mitchell (2011) find that firms borrowing from the target have a substantially higher probability of being a “DROP” firm, we find that only small firms borrowing from the target have a higher probability of being a “DROP” firm. Furthermore, even for these firms, the increase in the probability of being a “DROP” firm is only 1%, and this is one order of magnitude smaller than the increase found in previous studies. The firms initially borrowing from the acquirer bank have a 1% higher probability of being a “SWITCH” firm, and the sign and magnitude of this increase is consistent with the previous findings in the literature.

We also find that firms dropped by a bank that merges are 1% more likely to miss a payment compared to firms dropped by another bank, and firms that stay with a bank that merges are 4% more likely to miss a payment compared to similar firms that stay with another bank; these differences are significant at the 1% level. On the other hand, we do not find significant differences in the access to credit, the sales growth or the probability of

going out of business among these firms. This suggests that the increase in the probability of missing a payment is the consequence of frictions in the reorganization of the merged bank, not due to financial or economic distress inflicted on the firms that are dropped by the merged bank or that stay with the merged bank.

Overall we find that the effect of a merger on the firms' performance and the firms' access to finance is small in the short run and minimal at most in the long run. Our findings suggest that the strong effect documented in previous work is the result of changes in the economic conditions that cause the merger in the first place, not the result of the merger itself.

I Setup of The Natural Experiment and Descriptive Statistics

A Setup of The Natural Experiment

The majority of the empirical studies that examine the impact of bank mergers and takeovers face the challenge that the decision to merge is endogenous. Furthermore, the banks that merge also choose their partner bank, the date of the announcement, and the date of the merger. All these decisions are strongly affected by dynamic changes in the borrowers' investment opportunities. To address this limitation, we study a merger in Chile that can

be fairly assumed to be independent of the borrowers' investment opportunities.

What makes this merger unique is the fact that it was driven by contingencies in the Spanish financial market, not by changes in investment opportunities of the firms in Chile. In particular, the merger was the result of the union of two financial holdings in Spain in 1999, Banco Santander and Banco Central Hispano, that later became the Banco Santander Central Hispano (BSCH). Banco Santander was the owner of Banco Santander Chile, and Banco Central Hispano had a 40% stake in Banco de Santiago. In April 2002, BSCH bought 35% of Banco de Santiago, raising its participation from 40% to 75%, and in August of 2002 the two banks merged their operations (see Morel (2003) for the details of the merger). However, the banks in Chile represented less than 1% of the operations of holdings in Spain. Therefore, we can fairly assume that the merger was driven by contingencies in the Spanish financial markets and not by contingencies in the Chilean markets. Furthermore, Banco Santander Chile and Banco de Santiago had no commercial ties before the merger of the Spanish Holdings, which substantially reduces the likelihood of a merger between the two banks in the absence of the BSCH merger

Even if the merger is unrelated to the firms' investment opportunities, the results can be biased if some borrowers are able to anticipate the merger and pre-sort. In figure 2, we observe that the merger in Spain was not anticipated by the market, thus setting 1998 as a starting point for the analysis guarantees that borrowers are not pre-sorted yet. Furthermore in figure 1, we show that before the merger in Chile, there is no unusual borrowing activity,

which confirms that results are not driven by self-selection.

Downward bias can also arise if the analysis includes mergers or acquisitions wherein the banks continue operating as independent units. We confirmed with practitioners and government officials that after the merger, the banks consolidated their operations into a single operating unit. Many branches were closed, the administration was consolidated, and a central information system was set up. Because of legal restrictions, the loans were not consolidated, but the borrowers were assigned to the same loan officer, and redundant loan officers were reassigned or dismissed. Though the event we study is a merger, to facilitate the reading of the paper, we refer to the largest bank in the merger as the “acquirer”, and we refer to the smallest bank in the merger as the “target” or the “acquired”.

B Descriptive Statistics

For this study, we use a data set from the Chile Bank Regulation Department “SBIF” that contains financial information at the firm-bank level.² This data is self-reported by formal financial institutions, which are required by law to report data, and audited by the SBIF. The data set contains the total loan amount and the late payments for every firm and individual at each bank. The late payments are divided into amount past due for 90 days or less and amount past due for more than 90 days.³ In addition to the variables contained

²SBIF is the acronym in Spanish for Superintendencia de Bancos e Instituciones financieras.

³Similar registries exist in other countries. The information collected in these registries varies across countries. Some countries collect very detailed information about the borrowers that can include credit amount, late payments, demographic data, credit inquiries, ratings, and even utility payments. Other

in the database, we calculate the number of lending banks per firm, defined as the total number of banks that have non-zero credit with the firm. The SBIF uses the reported data to control whether the banks satisfy the capital requirements outlined in the Basel treaty. Also, an aggregated version of the data that includes the total debt and late payments (but does not disclose the distribution of credit among financial institutions) is made available to financial institutions to ensure that they are aware of the leverage of the borrowers when they make a lending decision.

We also use data from the tax revenue office that contains the revenues and assets of taxpayers expressed in deciles. Using this information, we construct the variable termination that takes the value of one if a firm stops reporting to the tax revenue office and zero otherwise.

In Table I we present summary statistics for the Chilean bank industry in the year that precedes the merger in Spain. The average loan size in the financial system is \$907, and the average borrowing per individual is \$1,495. Excluding non-commercial borrowers, the average borrowing per firm is \$4,064. The firms with more than one bank relationship are more than ten times larger than the firms borrowing from only one bank. The percentage of firms with more than 90 days in arrears is 3.8%. The lending to the 30% largest firms obtain 95.2% of the total lending. The percentage of borrowers with more than one bank relationship is 36.3%; however, these borrowers account for more than 75% of the total

countries collect less detailed information, and in some countries the information is only collected for large borrowers (Djankov, McLiesh, and Shleifer (2007)).

lending. When we exclude non-commercial borrowers, the percentage of firms borrowing from multiple sources is only 14.8%, but firms with multiple lending relationships obtain 78.1% of the total lending.

Banks have, on average, US\$3.3 billion in assets, 7.3% return on equity, a 12.2% capitalization rate, and 18.9% annual growth in deposits.

II Methodology

There are three important conditions that can bias the estimation of the economic implications of a merger. First, the firms that borrow from the banks that merge might be different from the firms that borrow from other banks. Second, the merger can be the result of changes in the investment opportunities of the firms. Lastly, the firms can self-select as soon as they learn about the merger. We include firm fixed effects to address the first problem. This approach resembles the methodology in Khwaja and Mian (2008) and has already been used in the analysis of mergers. What is novel in our study is that we also address the second problem by studying a merger that is unrelated to changes in the firms' investment opportunities as described in section A. Furthermore, we are also able to address the third problem by constructing our sample with information observed well before the firms are able to anticipate the merger.

The approach described in Khwaja and Mian (2008) provides a clean identification of

the bank lending channel for firms borrowing from multiple banks. However, it does not apply to firms that borrow from a single lender as it would not be possible to include fixed effects. For these borrowers, we use recent techniques proposed in Degryse, Masschelein, and Mitchell (2011). This approach groups single borrowers into categories according to their borrowing situation before and after the merger, and it estimates the effect of the merger separately within each of these categories. The later approach is valid under the assumption that borrowers in each category are indeed comparable. We do not question this assumption; instead, we follow the methodology and test if the findings in Degryse, Masschelein, and Mitchell (2011) hold when the studied merger is unrelated to the firms' investment opportunities.

A Estimating the Bank Lending Channel on Borrowers with Multiple Banks

We first consider firms that borrow from multiple banks. In the baseline specification we assume that other than the merger, all banks experience similar shocks. Therefore, the change in the size of a loan from bank j to client i depends on shocks to client i and whether the lending bank is the result of a merger. This leads to the following specification:

$$\Delta l_{ij} = c + \eta_i + \beta m_j + \varepsilon_{ij}, \tag{1}$$

where Δ is the time first difference operator, l_{ij} is the logarithm of the size of the loan from bank j to client i , η_i captures the effect of shocks to the borrower, and m_j is a binary variable that takes the value of one if bank j is the result of a merger, and zero otherwise.

In the baseline specification, we implicitly assume that the merger affects the clients of the target, the clients of the acquirer, and the clients that borrow from both banks that merge (the “overlapping clients”) equally. To relax this assumption we substitute m_j in equation 1 with three variables that capture the exposure of the borrower to the merger: ta_{ij} , a_{ij} , and o_{ij} , where ta_{ij} is the “target dummy variable” and takes the value of one if the bank j is the result of a merger and borrower i originally borrows from the target but not from the acquirer and zero otherwise, a_{ij} is the “acquirer dummy variable” and takes the value of one if the bank j is the result of a merger and borrower i originally borrows from the acquirer but not from the target and zero otherwise, and o_{ij} is the “overlap dummy variable” and takes the value of one if the bank j is the result of a merger and borrower i originally borrows from both the target and the acquirer and zero otherwise. This leads to the following specification:

$$\Delta l_{ij} = c + \eta_i + \beta_{ta} ta_{ij} + \beta_a a_{ij} + \beta_o o_{ij} + \varepsilon_{ij}. \quad (2)$$

To relax the assumption that banks face similar shocks we consider a set of K bank characteristics r_k that might affect the lending of bank j to borrower i . This leads to the main specification in the empirical section:

$$\Delta l_{ij} = c + \eta_i + \beta_{ta} ta_{ij} + \beta_a a_{ij} + \beta_o o_{ij} + \sum_K \beta_{r_k} r_{kj} + \varepsilon_{ij}, \quad (3)$$

where r_{kj} represents the value of the characteristic r_k of bank j .

We use a similar specification to estimate the effect of the merger on the extensive margin, the probability of missing a payment, and the probability of default. In these specifications we replace l_{ij} respectively with: b_{ij} which takes the value of zero if client i has a loan with bank j and one otherwise, m_{ij} which takes the value of one if client i has a past due amount of less than 90 days with bank j and zero otherwise, and d_{ij} which takes the value of one if client i has a past due amount of more than 90 days with bank j and zero otherwise.⁴

For robustness, we also estimate equation 3 excluding the firms fixed effects but including controls for the sales amount and the assets amount of the firms before the merger. These variables are extracted from the database of the tax revenue office and are expressed in deciles.⁵ To capture non-linear effects of sales on the variables of interest we include one dummy variable for each sales amount decile d . We use the same approach to capture non-linear effects of the assets amount on the variables of interest. This leads to the following specification:

⁴Clients with past due amount of more than 90 are considered to be in default by the Bank Regulation Department, and force the bank to increase the loan loss provision substantially.

⁵For legal reasons, the tax revenue office cannot disclose the exact sales and assets amount of each company.

$$\Delta l_{ij} = c + \eta_i + \beta_{ta} ta_{ij} + \beta_a a_{ij} + \beta_o o_{ij} + \sum_K \beta_{r_k} r_{kj} + \sum_d (\beta_{a_d} a_{di} + \beta_{s_d} s_{di}) + \varepsilon_{ij}, \quad (4)$$

where d indicates the decile a_{di} takes the value of one if the assets amount of firm i are in decile d and zero otherwise, and s_{di} takes the value of one if the sales amount of firm i are in decile d and zero otherwise.

In the specification, without fixed effects, we can explore heterogeneous treatment effects. In particular, we study if the effect of the merger depends on the firms' size because many studies document that small firms are more affected by the merger than large firms (Sapienza, 2002; Berger and Udell, 1995; Berger, Klapper, and Udell, 2001; Cole, Goldberg, and White, 2004). We divide firms into the 30% largest firms and the 70% smallest firms according to the firms' total borrowing, and we create a dummy variable sm that takes the value of one if the firm belongs to the bottom 70%.⁶ The variable sm is then interacted with the merger dummy variables ta , a , and o . This leads to the following specification:

$$\Delta l_{ij} = c + \eta_i + \beta_{ta} ta_{ij} + \beta_a a_{ij} + \beta_o o_{ij} + \beta_{tas} ta_{ij} \times sm_i + \beta_{asm} a_{ij} \times sm_i + \beta_{osm} o_{ij} \times sm_i + \beta_{sm} sm_i + \sum_K \beta_{r_k} r_{kj} + \sum_d (\beta_{a_d} a_{di} + \beta_{s_d} s_{di}) + \varepsilon_{ij},$$

⁶The same firm size classification is used in Khwaja and Mian (2008)

where we adopt the same definition for the variables used in equation 4, sm_i is the size dummy variable for firm i , and \times is the interaction operator.

B Estimating the Firm Borrowing Channel on Borrowers with Multiple Banks

In this section, we outline a methodology that captures the extent to which firms can start new bank relationships and offset the effect of the merger. We define the aggregated left hand side variable L_i as the total borrowing of client i in the formal financial system, and the aggregated left hand side variables B_i , M_i and D_i , as the loan-size weighted average of the variables b_{ij} , m_{ij} , and d_{ij} defined in subsection II.A. In the same way, we define the aggregated exposure to the merger variables TA_i the “aggregate exposure to the target”, A_i the “aggregate exposure to the acquirer”, and O_i the “aggregate exposure to the target and the acquirer”, as the loan-size weighted average of the variables ta_{ij} , a_{ij} , o_{ij} defined in subsection II.A. We also define \overline{R}_{ki} , as the loan-size weighted average of the variable r_{kj} defined in subsection II.A.⁷ Using the aggregated variables we estimate the following specification:

$$\Delta L_i = c + \eta_i + \beta_{TA}TA_i + \beta_A A_i + \beta_O O_i + \sum_K \beta_{R_k} R_{ki} + \varepsilon_i. \quad (5)$$

⁷The weights are estimated according to the formula $w_{ij} = \frac{l_{ij}}{\sum_j l_{ij}}$

If the merger is correlated with other shocks at the firm level (represented by η_i), the parameters estimated using specification 5 will be biased. However, we argue that the merger is unrelated to the firms' characteristics and therefore we expect $cov(TA_i, \eta_i)$, $cov(A_i, \eta_i)$, $cov(O_i, \eta_i)$ to be relatively small. Furthermore, table IV shows that the estimated effect of the merger on the default probability of the firms does not change when firm fixed effects are included. This is consistent with the idea that the merger is not a consequence of changes in the quality of the firms. To further reduce the magnitude of any potential biases, in the regression we include all the characteristics of the firms that we observe. This leads to the following specification:

$$\Delta L_i = c + \eta_i + \beta_{TA}TA_i + \beta_A A_i + \beta_O O_i + \sum_K \beta_{R_k} R_{ki} + \sum_d (\beta_{a_d} a_{di} + \beta_{s_d} s_{di}) + \varepsilon_i, \quad (6)$$

which is the aggregated version of equation 4.

In the analysis, we also include the size variable defined in subsection II.A, and its interaction with the aggregated exposure to the merger: TA , A , and O . This leads to the following specification:

$$\Delta L_i = c + \eta_i + \beta_{TA}TA_i + \beta_A A_i + \beta_O O_i + \beta_{TAsm}TA_i \times sm_i + \beta_{Asm}A_i \times sm_i + \beta_{Osm}O_i \times sm_i + \beta_{sm}sm_i + \sum_K \beta_{R_k}R_{ki} + \sum_d (\beta_{a_d}a_{di} + \beta_{s_d}s_{di}) + \varepsilon_i, \quad (7)$$

which is the aggregated version of equation 5.

C Estimating Effect of the Merger on Borrowers with one Bank

The effect of the merger on borrowers with only one bank relationship cannot be quantified with a firm FE estimation, thus we follow the methodology in Degryse, Masschelein, and Mitchell (2011). We group borrowers according to their lending relationships before and after the merger, and we estimate the effect of the merger separately for each group. The group “STAY” is comprised of firms that borrow from the same bank before and after the merger, the group “SWITCH” is comprised of firms that borrow from different banks before and after the merger, and the group “DROP” consists of firms that borrow from only one bank before the merger and do not have debt after the merger. In this approach, the effect of the merger can be identified as long as the companies in the same group are “comparable”, i.e. follow a similar trend if the merger does not happen. In this paper, we do not study the validity of the latter assumption. Instead, we test if the methodology applied to our setup, (where the merger is unrelated to the firms’ investment opportunities) returns results

consistent with the findings in previous work that uses a similar methodology. An example is Di Patti and Gobbi (2007), and Degryse, Masschelein, and Mitchell (2011).

We begin the analysis studying if the merger affects the probability that the relationship between firm i and bank j is discontinued and not replaced by a new lending relationship. We use the methodology described in subsection II.B to construct the variables that capture the effect of the merger, but we omit the variable O because in this section we study firms that borrow from one bank before the merger. This leads to the following specification:

$$DROPPED_i = c + \eta_i + \beta_{TA}TA_i + \beta_A A_i + \beta_{TAsm}TA_i \times sm_i + \beta_{Asm}A_i \times sm_i + \beta_{sm}sm_i + \sum_K \beta_{R_k}R_{ki} + \sum_d (\beta_{a_d}a_{di} + \beta_{s_d}s_{di}) + \varepsilon_i, \quad (8)$$

where the definition of the variables is akin to the definition used in subsection II.B, and where $DROPPED_i$ takes the value of one if firm i is “DROPPED” and zero otherwise.

We use a similar specification to study if the merger affects the probability of discontinuance of the relationship between firm i and bank j , while creating a new lending relationship.

We also study whether the firms “DROPPED” by the target or by the acquirer have a different performance in the three years that follow the merger compared to the firms “DROPPED” by other banks. The specification is similar to the formulas 6, and 7 described in subsection II.B, but the analysis only includes firms in the group “DROP”. We use a similar procedure to estimate if the firms that “SWITCH” from one of the banks that merge

have a different performance compared to the firms that “SWITCH” from other banks. The same procedure is used to test whether the firms that “STAY” with one of the merging banks have a different performance compared to the firms that “STAY” with other banks.

III The Effect of the Merger on Firms with Multiple Lending Relationships

A Intensive Margin

Column 1 in table II presents the fixed effect linear estimation of specification 3. On average two years after the merger, the firms initially borrowing from the target (and also from other banks outside of the merger), do not experience a change in the amount borrowed from the merged bank, compared to the amount borrowed from other banks.⁸ The firms initially borrowing from the acquirer do not experience a significant change in the amount borrowed from the merged bank either. On the other hand, the firms originally borrowing from both banks that merge, the “overlap” firms henceforth, experience an average reduction of 20% per year in the amount borrowed from the merged bank compared to the change in the amount borrowed from other banks, and this reduction is significant at the 1% level. Figure 1 is the graphical counterpart to the regression in column 1 and shows that the reduction

⁸The “initial banks” are defined as banks lending to the firm before the merger. We use this definition throughout the paper.

in the amount borrowed from the merging banks starts at the end of the year 2002. This confirms that the merger is not the consequence of previous changes in the lending behavior of the firms.

The remaining columns present the median quantile regression of specifications 3 to 7.⁹ Column 2 presents the fixed effect quantile estimation of the bank lending channel.¹⁰ The results are consistent with the FE linear estimation presented in column 1; the median change in the amount borrowed from the merged banks compared to the change in the amount borrowed from other banks is 1.3% for firms initially borrowing from the acquirer, 0.5% for firms initially borrowing from the target, and -11.4% for “overlap” firms. The latter result implies that most “overlap” firms experience a reduction in the amount lent by the merged bank, compared to the change in the amount lent by other banks. Column 3 removes the firms’ fixed effects and includes firm controls instead. In this estimation the median reduction in the amount borrowed by “overlap” firms from the merged bank is 8%, significant at the 1% level. Interestingly, the median change in the amount lent by the merged bank to “overlap” firms does not depend on the size of the firm, as seen in column 4. This suggests that the merged bank reduces lending to these firms across the board and not only to small firms.

Column 5 studies the extent to which firms borrow from other banks to compensate

⁹The effect of the merger on the average loan size is strongly affected by outliers. On the other hand, the effect on the median is not affected by outliers and therefore is more informative about what happens to “most” of the firms in the sample.

¹⁰The statistical significance of the fixed effect quantile regression is not defined, therefore we only show a point estimate.

for any changes in the amount lent by the merged bank. We find that most firms borrow enough from other banks to compensate for the change in the amount lent by the merged bank, therefore most firms do not experience a change in their total borrowing.¹¹ This is true even for “overlap” firms. The additional borrowing might be obtained from pre-existing bank lending relationships or new bank lending relationships. The evidence in the paper suggests that at least some of the additional borrowing comes from new bank relationships. We discuss this topic later in subsection III.D.

We find heterogeneous treatment effects. In particular, most small “overlap” firms experience a reduction in their total borrowing, which indicates that these firms do not borrow enough from other banks to offset the reduction in the amount lent by the merged bank. However the total debt of firms initially borrowing from only one of the banks that merge does not seem to be affected by the merger, even for small firms.

In the long run, the change in the aggregate amount borrowed by firms initially borrowing from the merging banks is not different from the change in amount borrowed by similar firms initially borrowing from other banks. The latter result suggests that the merger does not affect the firms’ long term access to finance.

¹¹We estimate the aggregate effect “the firm borrowing channel” using the median quantile estimation of specifications 6 and 7

B Extensive Margin

Column 1 in table III shows that “overlap” firms have a 1.5% lower probability rate of exiting from the lending relationship with the merged bank compared to exiting from lending relationships with other banks.¹² However, we believe that this result as well as similar results documented in previous work is not the consequence of changes in credit allocation but rather a consequence of how “exit” is measured in the literature. In most empirical studies, borrower i “exits” bank j at time t if the amount borrowed at time t is zero and the amount borrowed at time $t - 1$ is larger than zero. For most firm-bank relationships, the earliest this can happen is when the loan reaches maturity; however, for “overlap”-merged bank relationship, the earliest this can happen is when both pre-existing loans reach maturity which happens later on average.¹³ Column 1 in table III also shows that firms initially borrowing from the target have 1.3% higher probability of exiting from the lending relationship with the merged bank compared to the probability of exiting from the lending relationship with other banks. The reason might be that the replacement of the dismissed loan officers after the merger are less likely to renew loans, see Drexler and Schoar (2012). Firms originally borrowing from the acquirer do not experience a change in the probability of exiting from their relationship with the merged bank, and this is consistent with anecdotal

¹²The analysis in table III includes the linear probability estimation of specifications 3 to 7, where we use b and B , defined in subsections II.A and II.B, as the left hand side variables. Similar results are obtained using a logistic estimation but are omitted for brevity.

¹³In most cases a bank cannot unilaterally change the maturity of a pre-existing loan unless the borrower becomes delinquent on the payments.

information that most loan officers from the acquirer were not dismissed. Column 3 shows that the decrease in the “overlap” firms’ probability of exit does not depend on the size of the firm, and this is consistent with our view that the reduction in the exit probability is the result of the definition of exit and thus is independent of the firms characteristics. The exit rate of the firms initially borrowing from only one of the banks that merge on the other hand, does depend on the firms’ size. Larger firms originally borrowing from only one of the banks that merge are more likely to exit the relationships with the merged bank. This result is in contrast with the findings in Karceski, Ongena, and Smith (2005); Degryse, Masschelein, and Mitchell (2011), but it is consistent with the findings in Sapienza (2002), who documents a positive relationship between firm size and exit rate.

Columns 4 and 5 show that the average exit rate in the short run is not affected by the merger. In the long run, the “overlap” firms present a lower exit rate compared to similar firms initially borrowing from other banks, but the difference is not statistically significant.

C Performance and Repayment Behavior

So far we have showed that a merger that is unrelated to the changes in the firms’ investment opportunities has minimal effects on the firms’ availability of credit. In this section, we study if the repayment behavior of the firms after the merger is consistent with the changes in the availability of credit. Table IV estimates changes in default rate using a linear probability model. In all the columns, the difference in the default rate of the firms affected by the

merger and the default rate of other firms is never above 1%. This is true in the short run, as well as in the long run and suggests that the overall effect of the merger on the firms' payment capacity is minimal. Columns 3 and 5 present the heterogeneous treatment effects and show that the default rate of small "overlap" firms is 1% larger than the default rate of similar firms initially borrowing from other banks. This is consistent with our findings in subsection III.A; small overlap firms have short term financial constraints and therefore lack liquidity to meet their loan obligations.

While the probability of outright default is not affected by the merger, the probability that a firm misses a payment to the merged bank in the two years that follow the merger is much higher than the probability that the same firm misses a payment to another bank as shown in columns 1, 2 and 3 in table V. This is true for the "overlap" firms, for the firms initially borrowing from the target, and for the firms initially borrowing from the acquirer banks. We think that the increase in the number of clients that fail to make payments is a consequence of frictions in the reorganization of the bank, such as consolidating the collection procedures, or centralizing the information system. Column 8 in table V shows that in the long run, the differences in the probability of missing a payment disappear. This supports our view that the deterioration of the repayment behavior is not caused by financial distress, but rather by frictions that disappear after the reorganization of the merged bank is completed. Other explanations, such as information loss during the merger or deterioration of the lending relationships with the bank are unlikely, because we do not

observe a reduction in borrowing.

Table VI documents a small effect of the merger on the firms' sales and probability of going out of business. These findings provide further evidence that the merger does not increase the likelihood of entering financial distress.

D Number of Bank Relationships

Subsection III.A shows that many firms can borrow from other sources to offset the reduction in the amount lent by the merged bank. This section explores the extent to which firms obtain additional funds from bank lending relationships started after the merger. Column 1 in table VII shows that two years after the merger the number of bank lending relationships of firms initially borrowing from one or from both of the banks that merge is not statistically different from the number of bank lending relationships of similar firms initially borrowing from other banks.¹⁴ The last finding is true even for the “overlap” firms, which is particularly surprising since we know that these firms lose one bank lending relationship after the target and the acquirer merge.

Column 2 in table VII shows that, two years after the merger small “overlap” firms have, on average, 0.3 fewer bank lending relationships compared to similar firms initially borrowing from banks that do not merge. This reduction is significant both economically and statistically. The 0.3 reduction in the number of lending relationships of small “overlap”

¹⁴Table VII presents the OLS estimation of specifications 5 to 7 and uses the number of bank relationships as the left hand side variable.

firms still indicates that many of these firms are able to start new bank lending relationships soon after the merger, otherwise the reduction would be closer to 1. Column 2 also shows that small firms initially borrowing from the acquirer have, on average, 0.13 more bank lending relationships two years after the merger compared to similar firms initially borrowing from other banks. However, firms initially borrowing from the target do not seem to change their number of bank lending relationships as a consequence of the merger. These results persist if we control for bank and firm characteristics.

The fact that many small “overlap” firms and most large “overlap” firms recover their initial number of lending relationships after the merger shows that part of the additional borrowing comes from new bank lending relationships. It also suggests that companies target a specific number of banks and the number of banks plays an important role in the ability of the firms to raise capital. The relation between the firms’ number of banks and the firms’ credit availability has been proposed in prominent theoretical models of debt structure such as Bolton and Scharfstein (1996) and Rajan (1992), but it has been difficult to test empirically because oftentimes the number of lending relationships is endogenously decided by the firms.

IV The Effect of the Merger on Firms with Single Lending Relationships

A Changes in The Probability to be a ‘DROP’, or a ‘SWITCH’ firm

The firms that borrow from a single bank might be the most affected by the merger, because they lack an alternative source of finance in the short run and they can be held-up by their initial bank, see Rajan (1992). The fixed effect estimation used in the previous section cannot be used to quantify the effect of the merger on these firms. Therefore, we follow the methodology in Degryse, Masschelein, and Mitchell (2011) described in the subsection II.C.

Column 1 in table VIII shows that large firms borrowing from the target, as well as large firms borrowing from the acquirer are not more likely to be a ‘DROP’ firm compared to similar firms initially borrowing from a bank that does not merge.¹⁵ Column 1 also shows that small firms initially borrowing from the acquirer are not more likely to be a ‘DROP’ either. However, small firms initially borrowing from the target are, on average, 1.1% more likely to be a ‘DROP’ compared to similar firms borrowing from a bank that does not merge. The increase in the probability of being a ‘DROP’ is significant at the 5% level,

¹⁵Table VIII presents the linear probability estimation of specification 8. This estimation explores whether the firms initially borrowing from the target or the firms initially borrowing from the acquirer are more likely to be a ‘DROP’ or ‘SWITCH’ firm compared to the firms originally borrowing from other banks. The logistic model estimation of specification 8 obtains similar results and is omitted for brevity.

but its magnitude is several times smaller than the increase in the probability of being a “DROP” documented in Degryse, Masschelein, and Mitchell (2011).

Column 2 shows that large firms originally borrowing from the target are 0.8% more likely to be a “SWITCH” compared to firms borrowing from banks that do not merge. The sign and magnitude of this change is consistent with the findings in previous empirical work.

The next step in the analysis is to explore whether the “DROP”, “SWITCH”, and “STAY” firms initially borrowing from the acquirer or the target have a different performance in the years that follow the merger compared to the “DROP”, “SWITCH”, and “STAY” firms initially borrowing from other banks.

B Post Merger Performance of Firms with Single Lending Relationships

Table IX studies if the firms dropped by the target and/or dropped by the acquirer have a different economic performance after the merger compared to the firms dropped by a bank that does not merge. Column 1 shows that large firms dropped by the acquirer experience a reduction of 27% in their total borrowing compared to similar firms dropped by a bank that does not merge.¹⁶ These firms are also 1.7% more likely to miss a payment compared to firms dropped by a bank that does not merge, but they are not more likely to default.

¹⁶More than 50% of the firms dropped by the target do not get credit in the years that follow the merger. The same is true for the firms dropped by the acquirer and the firms dropped by banks that do not merge. Therefore, it is not possible to estimate a 50 percent quantile regression, causing us to estimate an OLS instead.

The reduction in the amount borrowed by firms dropped by the target is not significantly different from the reduction in the amount borrowed by similar firms initially borrowing from another bank. Also the probability of these firms missing a payment or going into default is not significantly different from that of similar firms initially borrowing from a bank that does not merge. Column 4 shows that the sales growth of firms dropped by the target and the sales growth of firms dropped by the acquirer is similar to the sales growth of firms dropped by banks that do not merge. Column 5 shows that the firms dropped by the target, the firms dropped by the acquirer, and the firms dropped by a bank that does not merge have a similar probability of going out of business in the years that follow the merger.

The results from table IX and section III point in the same direction: firms exposed to the merger experience minimal changes in the availability of credit and do not have a higher probability of entering financial distress. Given these findings, we do not expect the firms borrowing from a bank that merges to have a higher probability of switching compared to the firms borrowing from other banks, which is indeed confirmed in table VIII. All of these circumstances reduce the number of “SWITCH” firms in the sample, and make the analysis of switch firms irrelevant. For completeness, the effects of the merger on “SWITCH” firms is still presented in the appendix.

Column 3 in table X shows that the firms that stay with the merged bank are 4% more likely to miss a payment compared to the firms that stay with another bank, and the

difference is significant at the 1% level. The probability of default is also higher for the firms that stay with the merged bank, but the magnitude of the increase in default is four times smaller and only significant at the 10% level. The sales growth and the probability of shut down on the other hand are not affected by the merger. Furthermore, the merger does not seem to affect the amount borrowed by large firms that stay with the acquirer, the amount borrowed by small firms that stay with the acquirer, and the amount borrowed by large firms that stay with the target. Also, the small firms that stay with the target experience an increase in their borrowing compared to similar firms that stay with another bank. These findings suggest that the increase in the probability of missing a payment is the consequence of frictions in the reorganization of the merged bank not due to financial or economic distress inflicted on the firms that stay with the merged bank.

V Conclusion

We study a merger that is unrelated to the investment opportunities of the firms in the economy. Our findings suggest that *ceteris paribus*, mergers impose minimal costs on firms. The merged bank does not reduce the amount lent to the firms initially borrowing from only one of the banks that merge. While the merged bank reduces lending across the board to the firms initially borrowing from both banks that merge, most of these firms can borrow from other sources and compensate this reduction. Only small firms in this group find it difficult

to compensate the reduction in the amount borrowed from the merged bank. Nonetheless, even these firms can borrow from other sources in the long run and compensate the reduction in the amount borrowed from the merged bank.

Most of the firms that borrow from only one of the banks that merge do not seem to be affected either. On average, these firms are not more likely to switch to another bank or stop borrowing after the merger compared to similar firms originally borrowing from a bank that does not merge. However, even the firms that are more likely to switch banks or stop borrowing from the merged bank after the consolidation have similar access to credit in the long run compared to other firms in the economy.

Companies initially borrowing from the banks that merge do experience a sharp increase in the probability of missing a payment after the merger, but their probability of default increases very slightly. Furthermore, in the long run, all the firms have a similar repayment rate. This suggests that the initial increase in the number of firms that miss payments is a consequence of frictions in the reorganization of the merged bank, not a consequence of economic or financial distress inflicted by the merger on borrowers.

Overall, we find that mergers have minimal effects on the firms' short term borrowing and repayment rate and no effects in the long run. Our findings indicate that the impact of mergers on the economic and financial situation of the firms documented in previous work is most likely explained by the changes in the firms' investment opportunities that cause the merger in the first place and not by the merger itself.

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Table I: Summary Statistics: Chilean Banking Industry

We present an overview of the Chilean Banking Industry at the end of 1998, just before the merger of the parent companies in Spain, and three years before the merger in Chile. A loan is defined as a bank-firm pair i.e. multiple loans from the same bank are aggregated up. A firm's total borrowing is the summation of all its loans. We rank firms according to total borrowing at the end of 1998, firms at the 70% bottom of the ranking are classified as small. Firm i is considered to have a lending relationship with bank b if i has non zero debt with b . A firm is considered to be in default if it has been in arrears for more than 90 days.

	average	sd	dollar amount
Log loan size (all borrowers)	6.81	(2.03)	907
Log total borrowing (all borrowers)	7.31	(2.08)	1,495
Log total borrowing (only firms)	8.31	(2.97)	4,064
Log total borrowing (firms $Nbanks > 1$)	11.12	(2.35)	73,130
Delinquency rate	0.038	(0.192)	
	<u>fraction</u>	<u>fraction</u>	
Amount lent to small - large borrowers	0.048	0.952	
Percentage of single - multiple bank borrowers	0.637	0.363	
Amount lent to single - multiple banks borrowers	0.227	0.773	
Percentage of single - multiple bank firms	0.852	0.148	
Amount lent to single - multiple banks firms	0.219	0.781	
	<u>average</u>	<u>sd</u>	
Bank assets US\$ million	3,302	(3,968)	
Bank ROA	0.006	(0.01)	
Bank ROE	0.073	(0.101)	
Bank Capitalization rate	0.122	(0.132)	
Bank Growth in deposits	0.189	(0.616)	

Table II: Bank Lending Channel and Firm Borrowing Channel, The Intensive Margin

This table examines how the merger affects the intensive margin of the bank lending channel and the intensive margin of the firm borrowing channel of the firms borrowing from multiple sources before the merger. We compare the logarithm of the amount borrowed two years after the merger to the logarithm of the amount borrowed three years before the merger. In columns 1, 2, and 3, the labels *overlap*, *acquirer* and *target* represent the variables o , a , and ta defined in subsection II.A, and capture the exposure of the firms to the merger. In columns 4, 5, 6 and 7, the labels *overlap*, *acquirer* and *target* represent the variables O , A , and TA defined in subsections II.B, and capture the exposure of the firms to the merger. To reduce the probability of results being driven by firms' self selection, the exposure to the merger is estimated using firms' borrowing in 1998, just before the merger in Spain, and more than three years before the merger of the subsidiaries in Chile. Column 1 presents the fixed effect linear estimation of specification 3 for changes between 1998 and 2003. Columns 2 and 3 present the OLS estimation of specifications 4 and 5 for changes between 1998 and 2003. Columns 4 and 5 present the OLS estimation of specifications 6 and 7 for changes between 1998 and 2003. Columns 6 and 7 present the OLS estimation of specifications 6 and 7 for changes between 2003 and 2006. All the estimations include controls for bank characteristics. Standard errors in parentheses are robust to heteroscedasticity. Standard errors in columns 1, 2 and 3 are clustered at the bank level.

	Bank lending channel				Firm borrowing channel			
	1998-2003				1998-2003		2003-2006	
overlap	-0.195*** (0.020)	-0.114***	-0.079*** (0.010)	-0.090*** (0.013)	-0.034 (0.026)	0.015 (0.037)	0.034 (0.040)	0.031 (0.059)
acquirer	0.002 (0.021)	0.013***	0.012 (0.007)	0.008 (0.011)	0.000 (0.018)	-0.013 (0.030)	-0.013 (0.028)	-0.015 (0.047)
target	-0.028 (0.020)	0.005***	0.016* (0.009)	0.021 (0.013)	-0.016 (0.020)	-0.011 (0.034)	0.009 (0.031)	0.002 (0.054)
small X overlap				0.031 (0.022)		-0.121*** (0.041)		0.009 (0.066)
small X acquirer				0.016 (0.015)		0.017 (0.027)		0.006 (0.044)
small X target				-0.002 (0.019)		-0.007 (0.034)		0.010 (0.054)
Firm FE	yes	yes	no	no	no	no	no	no
Firm controls	no	no	yes	yes	yes	yes	yes	yes
Bank controls	yes	yes	yes	yes	yes	yes	yes	yes
N	14038	14038	14038	14038	6151	6151	6151	6151
adjusted- r^2	0.175							

Table III: Bank Lending Channel and Firm Borrowing Channel, The Extensive Margin

This table examines how the merger affects the extensive margin of credit. In particular, we are interested in testing whether firms exposed to a merger are more likely to stop borrowing from their original banks and whether they are more likely to stop borrowing from all the banks after the merger, compared to similar firms not exposed to the merger. In columns 1, 2, and 3 the labels *overlap*, *acquirer* and *target* represent the variables o , a , and ta defined in subsection II.A, and capture the exposure of the firms to the merger. In columns 4, 5, 6 and 7 the labels *overlap*, *acquirer* and *target* represent the variables O , A , and TA defined in subsection II.B, and capture the exposure of the firms to the merger. To reduce the probability of the results being driven by the firms' self selection, the exposure to the merger is estimated using the firms' borrowing in 1998, just before the merger in Spain, and more than three years before the merger of the subsidiaries in Chile. Column 1 presents the fixed effect linear estimation of specification 3 for changes between 1998 and 2003. Columns 2 and 3 present the OLS estimation of specifications 4 and 5 for changes between 1998 and 2003. Columns 4 and 5 present the OLS estimation of specifications 6 and 7 for changes between 1998 and 2003. Columns 6 and 7 present the OLS estimation of specifications 6 and 7 for changes between 2003 and 2006. All the estimations include controls for bank characteristics. Standard errors in parentheses are robust to heteroscedasticity. Standard errors in columns 1, 2 and 3 are clustered at the bank level.

	Bank lending channel			Firm borrowing channel			
	1998-2003			1998-2003		2003-2006	
overlap	-1.493*** (0.344)	-2.338*** (0.295)	-2.192*** (0.311)	0.346 (0.558)	-0.351 (0.711)	-1.549 (0.995)	-1.764 (1.265)
acquirer	-0.105 (0.323)	0.010 (0.230)	0.612** (0.239)	-0.271 (0.359)	0.510 (0.524)	0.326 (0.758)	0.105 (1.056)
target	1.334*** (0.265)	0.585** (0.232)	0.983*** (0.251)	-0.558 (0.391)	0.502 (0.599)	0.624 (0.839)	1.108 (1.242)
small X overlap			-0.337 (0.290)		1.240 (0.846)		0.346 (1.395)
small X acquirer			-1.105*** (0.263)		-0.923* (0.482)		0.264 (0.948)
small X target			-0.726** (0.284)		-1.320** (0.592)		-0.618 (1.219)
Firm FE	yes	no	no	no	no	no	no
Firm controls	no	yes	yes	yes	yes	yes	yes
Bank controls	yes	yes	yes	yes	yes	yes	yes
N	26333	26333	26333	7214	7214	7214	7214
adjusted- r^2	0.227	0.060	0.063	0.031	0.032	0.006	0.005

Table IV: Default Rate

This table examines how a merger affects the default rate of the firms. In particular, we are interested in testing whether firms exposed to the merger have a higher probability of default compared to similar firms that are not exposed to the merger. For this analysis, we only include firms that are not delinquent on any payments in 1998. The variables *target*, *acquirer*, and *overlap* represent the exposure of the firms to the merger. An explanation of the definition of the “exposure to the merger” is presented in subsections II.A and II.B. To reduce the probability of the results being driven by the firms’ self-selection, the exposure to the merger is estimated using the firms’ borrowing in 1998, just before the merger in Spain, and more than three years before the merger of the subsidiaries in Chile. Column 1 presents the fixed effect linear estimation of specification 3, and columns 2 and 3 present the OLS estimation of specifications 4 and 5. Columns 4 and 5 present the OLS estimation of specifications 6 and 7 for default events between 1998 and 2003. Columns 6 and 7 present the OLS estimation of specifications 6 and 7 for default events between 2003 and 2006. All the estimations include controls for bank characteristics. Standard errors in parentheses are robust to heteroscedasticity. Standard errors in columns 1, 2 and 3 are clustered at the bank level.

	Default at the loan level			default at the firm level			
	1998-2003			1998-2003		2003-2006	
overlap	0.35*** (0.09)	0.31*** (0.10)	0.02 (0.12)	0.81** (0.40)	0.22 (0.52)	0.43 (0.63)	0.81 (0.85)
acquirer	-0.16 (0.10)	-0.14 (0.10)	-0.19 (0.13)	0.76*** (0.25)	0.72* (0.38)	0.66 (0.44)	0.48 (0.61)
target	-0.25*** (0.08)	-0.56*** (0.09)	-0.46*** (0.12)	0.25 (0.27)	0.35 (0.38)	-0.44 (0.45)	0.61 (0.68)
small X overlap			0.94*** (0.12)		0.93 (0.63)		-0.54 (0.97)
small X acquirer			0.12 (0.12)		0.04 (0.36)		0.22 (0.58)
small X target			-0.24* (0.12)		-0.13 (0.38)		-1.32** (0.67)
Firm FE	yes	no	no	no	no	no	no
Firm controls	no	yes	yes	yes	yes	yes	yes
Bank controls	yes	yes	yes	yes	yes	yes	yes
N	26333	26333	26333	7214	7214	7214	7214
adjusted- r^2	0.435	0.015	0.015	0.022	0.022	0.009	0.009

Table V: Late Payment Probability

This table examines how a merger affects the repayment behavior of the firms. We do not intend to capture economic or financial distress (we examine financial distress in table IV). Rather, we aim to capture the short term ability and-or incentives of the firms to honor their loan installments. In particular, we test whether firms exposed to the merger have a higher probability of being late on their payments to their original banks, or to other banks, for more than one month, but less than four months. For this analysis, we only include firms that are not delinquent on any payments in 1998. The variables *target*, *acquirer*, and *overlap* represent the exposure of the firms to the merger. The definition of the “exposure to the merger” is presented in subsections II.A and II.B. To reduce the probability of the results being driven by the firms’ self-selection, the exposure to the merger is estimated using the firms’ borrowing in 1998, just before the merger in Spain, and more than three years before the merger of the subsidiaries in Chile. Column 1 presents the fixed effect linear estimation of specification 3, and columns 2 and 3 present the OLS estimation of specifications 4 and 5. Columns 4 and 5 present the OLS estimation of specifications 6 and 7 for payments missed between 1998 and 2003. Columns 6 and 7 present the OLS estimation of specifications 6 and 7 for payments missed between 2003 and 2006. All the estimations include controls for bank characteristics. Standard errors in parentheses are robust to heteroscedasticity. Standard errors in columns 1, 2 and 3 are clustered at the bank level.

	Default at the loan level			Default at the firm level			
	1998-2003			1998-2003		2003-2006	
overlap	4.10*** (0.17)	3.79*** (0.20)	3.94*** (0.22)	2.98*** (0.52)	3.32*** (0.76)	-0.29 (0.93)	-0.44 (1.44)
acquirer	2.25*** (0.19)	2.24*** (0.17)	2.51*** (0.19)	2.45*** (0.33)	1.95*** (0.54)	-0.67 (0.66)	-0.48 (1.03)
target	2.31*** (0.18)	2.06*** (0.17)	2.46*** (0.19)	2.13*** (0.38)	1.86*** (0.62)	-1.34* (0.75)	-0.25 (1.23)
small X overlap			-0.42* (0.23)		-0.60 (0.87)		0.32 (1.55)
small X acquirer			-0.48** (0.23)		0.59 (0.52)		-0.23 (0.97)
small X target			-0.91*** (0.23)		0.33 (0.64)		-1.37 (1.24)
Firm FE	yes	no	no	no	no	no	no
Firm controls	no	yes	yes	yes	yes	yes	yes
Bank controls	yes	yes	yes	yes	yes	yes	yes
N	26333	26333	26333	7214	7214	7214	7214
adjusted- r^2	0.205	0.043	0.044	0.018	0.018	0.002	0.001

Table VI: Sales and Exit

This table examines how the merger affects the sales of the firm and its probability of shut down. In particular, we are interested in testing whether firms exposed to the merger experience a reduction in sales in the years and are more likely to shut down their operations in the years that follow the merger. The variables *target*, *acquirer*, and *overlap* represent the exposure of the firms to the merger. An explanation of the definition of the “exposure to the merger” is presented in subsection II.B. To reduce the probability that the results are driven by the firms’ self selection, the exposure to the merger is estimated using the firms’ borrowing in 1998, just before the merger in Spain, and more than three years before the merger of the subsidiaries in Chile. Columns 1 and 2 present the OLS estimation of specifications 6 and 7 for changes in sales between 1998 and 2003. In columns 3 and 4, we present the OLS estimation of specifications 6 and 7 for changes in sales between 2003 and 2006. In columns 5 and 6, we present the OLS estimation of specifications 6 and 7 for firms shut downs between 1998 and 2003. In columns 7 and 8, we present the OLS estimation of specifications 6 and 7 for firm shut downs between 2003 and 2006. Standard errors in parentheses are robust to heteroscedasticity.

	Change in sales				Shut down			
	1998-2003		2003-2006		1998-2003		2003-2006	
overlap	-0.025 (0.030)	0.002 (0.033)	0.054 (0.035)	0.041 (0.047)	-0.936 (0.614)	-1.368* (0.818)	1.169* (0.660)	0.209 (0.853)
acquirer	0.010 (0.018)	-0.044* (0.026)	-0.014 (0.027)	0.003 (0.037)	-0.104 (0.403)	0.667 (0.618)	0.770* (0.455)	0.687 (0.707)
target	0.023 (0.019)	-0.006 (0.027)	0.004 (0.028)	-0.006 (0.038)	-0.148 (0.444)	0.080 (0.688)	-0.251 (0.492)	0.174 (0.771)
small X overlap		-0.052 (0.046)		0.023 (0.049)		0.770 (0.933)		1.528 (0.997)
small X acquirer		0.065*** (0.024)		-0.021 (0.035)		-0.915 (0.572)		0.096 (0.662)
small X target		0.035 (0.026)		0.013 (0.037)		-0.271 (0.686)		-0.552 (0.759)
Firm controls	yes	yes	yes	yes	yes	yes	yes	yes
Bank controls	yes	yes	yes	yes	yes	yes	yes	yes
N	6352	6352	5275	5275	7214	7214	7214	7214
adjusted- r^2	0.205	0.206	0.024	0.023	0.050	0.050	0.006	0.006

Table VII: Changes in the Number of Banks

This table explores how a merger affects the firms' number of lending relationships. We estimate specifications 5 and 7 using the change in the number of lending relationships between 1998 and 2003 as the left hand side variable. The variables *target*, *acquirer*, and *overlap* represent the exposure of the firms to the merger (. An explanation of the definition of "exposure to the merger" is presented in subsection II.B. To reduce the probability of results being driven by the firms' self-selection, the exposure to the merger is estimated using the firms' borrowing in 1998, just before the merger in Spain and more than three years before the merger of the subsidiaries in Chile. Note that the merger will reduce the number of banks of the "overlap" group exactly by one if they do not start a new lending relationship after the merger. Standard errors in parentheses are robust to heteroscedasticity.

	Number of Banks			
overlap	-0.047 (0.056)	0.092 (0.111)	0.092 (0.116)	0.115 (0.136)
acquirer	0.007 (0.022)	-0.093* (0.055)	-0.093 (0.064)	-0.037 (0.083)
target	0.003 (0.030)	0.023 (0.082)	0.023 (0.089)	0.033 (0.107)
small X overlap		-0.285** (0.121)	-0.285** (0.121)	-0.377*** (0.145)
small X acquirer		0.128** (0.060)	0.128** (0.060)	0.129* (0.078)
small X target		-0.022 (0.088)	-0.022 (0.088)	0.011 (0.107)
Bank controls	no	no	yes	yes
Firm controls	no	no	no	yes
N	10719	10719	10719	7214
adjusted- r^2	0.010	0.023	0.023	0.050

Table VIII: Drop, Switch, and Stay Probabilities

This table examines the effect of the merger on the firm borrowing from only one bank at the time of the merger. In particular, we are interested in measuring whether the firms borrowing from the *target* before the merger or the firms borrowing from the *acquirer* before the merger are more likely to stop borrowing (to be a “DROP” firm) in the two years following the merger compared to similar firms initially borrowing from a bank that does not merge. We are also interested in measuring whether the firms borrowing from the *target* before the merger or the firms borrowing from the *acquirer* before the merger are more likely to switch banks (to be a “SWITCH” firm) compared to similar firms initially borrowing from a bank that does not merge. To facilitate the interpretation of the results we present the OLS estimation of specification 8. Similar results are obtained using a logistic estimation. Standard errors in parentheses are robust to heteroscedasticity.

	Drop	Switch
acquirer	-0.037 (0.376)	0.125 (0.202)
target	0.167 (0.435)	0.765*** (0.264)
small X acquirer	-0.118 (0.343)	-0.086 (0.185)
small X target	1.084** (0.467)	-0.200 (0.293)
N	14689	14689
adjusted- r^2	0.062	0.008

Table IX: “Drop” Firms Performance

This table examines the changes in performance between 2003 and 2006 of the firms dropped by the target and the acquirer, compared to the performance during the same period of firms dropped by other banks. We present changes in various indicators of borrower performance including loan size, repayment behavior, firm sales, and firm shut downs. We use a linear estimation of specification 7, and we exclude the variable O in the specification because there are no “overlap” firms in this sample. Standard errors in parentheses are robust to heteroscedasticity.

	Loan amount	Late	Default	Sales	Survive
acquirer	-0.271** (0.132)	1.674*** (0.546)	-0.131 (0.514)	0.052 (0.067)	0.700 (0.938)
target	-0.093 (0.169)	1.025 (0.659)	-0.332 (0.585)	-0.035 (0.069)	0.342 (1.112)
small X acquirer	0.170 (0.116)	-0.422 (0.538)	0.160 (0.495)	-0.078 (0.066)	0.697 (0.876)
small X target	-0.113 (0.165)	0.585 (0.722)	-0.483 (0.591)	-0.017 (0.075)	0.930 (1.146)
N	5068	5068	5068	1865	5068
adjusted- r^2	0.032	0.013	0.007	0.021	0.000

Table X: Stay Compare

This table examines changes in loan size, repayment behavior, and firm outcomes between 2003 and 2006 for firms that stay with the same bank between 1998 and 2003 (“STAY” firms). In particular, we estimate if the average change in the value of these variables for firms that stay with the acquirer is different from the average change in the value of these variables for firms that stay with a bank that does not merge. We also estimate if the average change in the value of these variables for firms that stay with the target is different from the average change in the value of these variables for firms that stay with a bank that does not merge. We use a linear estimation of specification 7, and we exclude the variable that captures the effect on “overlap” firms because there are no “overlap” firms in this sample. Standard errors in parentheses are robust to heteroscedasticity.

	Loan amount	Loan amount(q)	Late	Default	Sales	Survive
acquirer	0.041 (0.122)	0.005 (0.036)	4.028*** (0.659)	0.796 (0.511)	-0.016 (0.028)	-0.371 (0.637)
target	0.005 (0.145)	-0.003 (0.042)	4.720*** (0.802)	0.321 (0.586)	-0.009 (0.030)	-1.210* (0.708)
small X acquirer	0.060 (0.113)	-0.002 (0.033)	2.956*** (0.663)	1.036** (0.514)	0.034 (0.028)	0.416 (0.594)
small X target	0.427*** (0.160)	0.113** (0.047)	1.724* (0.976)	1.371* (0.712)	0.031 (0.033)	0.618 (0.798)
N	8582	8582	8582	8582	6260	8582
adjusted- r^2	0.020		0.035	0.015	0.013	0.008

Figure 1: Bank Lending Channel with Firm Fixed Effects

Figure 1 compares the lending within the same firms that borrow simultaneously from the merged banks and from banks outside of the merger. This figure is the counterpart of the fixed effect regression in column 1 of table II. Following Khwaja and Mian (2008), we classify firm loans into those from the merging banks and those from banks outside of the merger. We then demean each of the firms loans. The figure then aggregates the demeaned lending from merged banks and the demeaned lending from banks outside of the merger and plots the logarithm on the y-axis. Given the classification process, the same firm shows up in both the plotted lines. Given this demeaning, if the effect of the merger was correctly identified, we would expect to find little or no lending difference between the series before the merger, but a divergence afterwards. The figure shows that this is the case.

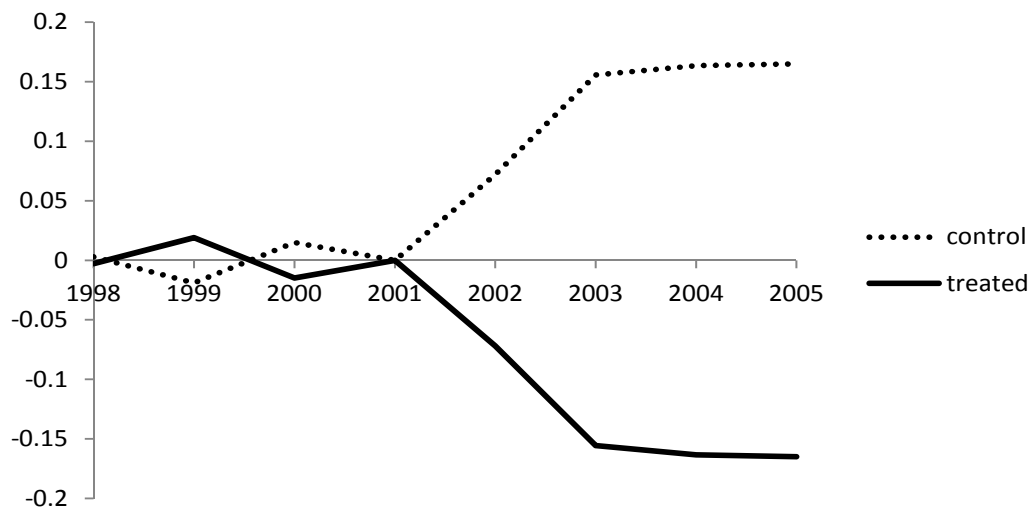


Figure 2: Returns and Trade Volume of Banco Santander España Before and After the Announcement of the Merger

Figure 2 plots the returns and trade volume of Banco Santander España before and after the announcement of the merger with Banco Central Hispano. The announcement was made on January 15th 1999. The solid line represents the returns and the dashed line represents the volume. Values have been re-scaled to fit the same graph. The range for the returns is -11.5% to 18.2%, and the range for the volume is 60,600 to 827,800 shares.

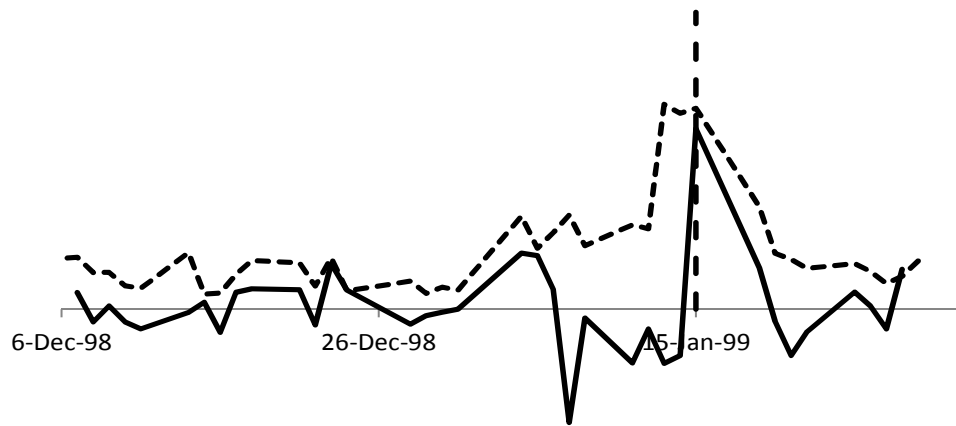


Table XI: Switch Compare

This table examines changes in loan size, repayment behavior, and firm outcomes between 2003 and 2006 for firms that switch banks between 1998 and 2003 (“SWITCH” firms). In particular, we estimate if the average change in the value of these variables for firms that switch from the acquirer to a different bank is different from the average change in the value of these variables for firms that switch from a bank that does not merge to a different bank. We also estimate if the average change in the value of these variables for firms that switch from the target is different from the average change in the value of these variables for firms that switch from a bank that does not merge. We use a linear estimation of specification 7, and we exclude the variable that captures the effect on “overlap” firms because there are no “overlap” firms in this sample. Standard errors in parentheses are robust to heteroscedasticity.

	Loan amount	Loan amount(q)	Late	Default	Sales	Survive
acquirer	0.055 (0.419)	-0.086 (0.155)	-0.198 (1.972)	-0.105 (1.826)	-0.050 (0.088)	2.048 (2.151)
target	-0.546 (0.427)	-0.260 (0.162)	-2.151 (1.935)	-3.231* (1.662)	-0.106 (0.079)	0.040 (2.100)
small X acquirer	-0.130 (0.382)	-0.011 (0.140)	1.274 (1.762)	0.223 (1.563)	0.018 (0.080)	-0.224 (1.953)
small X target	0.173 (0.438)	0.234 (0.160)	1.103 (1.884)	1.141 (1.475)	0.067 (0.075)	1.869 (2.096)
N	1039	1039	1039	1039	748	1039
adjusted- r^2	0.010		-0.001	0.050	0.042	0.012