

“Time for a Change”:

Loan Conditions and Bank Behavior When Firms Switch

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Abstract

We study a unique database allowing us to follow each borrower and bank through an extended period of time. As a result, we can document the full dynamic cycle of conditions and behavior before and after firms switch banks. Our findings suggest that engaging a new outside bank decreases the rate paid on a new loan by more than 50 basis points. The new bank is willing to decrease loan rates further by another 35 basis points within the next year and a half. After that the new bank starts hiking its loan rate, slowly at first but eventually at a clip of more than 30 basis points per year. After four years the loan rate charged by the new bank equals what the switcher obtained from its former inside banks before switching. We also find that outside banks attribute the best credit rating to the entire pool of new customers, in contrast to the current inside lenders of the firm whose discriminating ratings effectively determine the offered loan rates. Although the information-sharing regime in place allows the outside banks to attract mostly performing firms, outside banks still suffer from adverse selection because the credit information available is limited to two months prior to their information request.

Keywords: competition, banking sector, market structure.

JEL: G21, L11, L14.

I. Introduction

Turning to a new bank is a defining moment for both the firm and its current lenders, and hence a strategic decision often taken at the highest level. Yet, while there is substantial theoretical literature incorporating switching decisions and industry observers and academics pointedly refer to switching costs as a key source of bank rents,¹ there is a surprising lack of empirical evidence on contract conditions and bank-firm behavior right before and after a firm switches to a new bank. This paper aims to fill this gap.

We study a unique database that allows us to follow each borrower and bank through an extended period of time and to match the conditions obtained by any switching firm to the terms on loans obtained by a large group of non-switching firms. The size of the database allows us to focus on new loans assuring the usage of timely information.

The dynamic pattern of conditions and behavior that arises has not been documented before, as far as we know. Firms switch for a simple but very good reason: turning to a new bank substantially lowers the loan rate. In particular, engaging a new bank “decreases” the rate paid on a new loan by more than 50 basis points (compared to what the firm would have paid on a similar loan from one of its current lenders). And it doesn’t stop there. Upon switching, the new bank is willing to decrease loan rates further by another 35 basis points within the next year and a half.

However one year and a half after the switch, the now “inside” bank starts hiking the loan rates, slowly at first but eventually at a clip of more than 30 basis points per year.

After around four years the switcher is “back to square one”, i.e. the loan rate charged by the new bank now equals again what the switcher obtained from its inside banks before switching. Not surprisingly the firm will eventually, when its observable financial performance makes it possible, start looking for more favorable conditions elsewhere, a period during which the inside bank may moderate and even slightly reverse its rate hiking behavior. Sooner or later the firm may switch bank nevertheless.

A distinct feature of this loan rate cycle is the behavior of the outside banks. The new banks attribute their best credit rating to virtually the entire pool of all new customers; in contrast, the current lenders of the firm grade discriminately to determine a fair loan rate. Although the information-sharing regime allows the outside banks to attract mostly performing firms, outside banks still suffer from adverse selection because the credit information available is limited to two months prior to an information request. As a result some non-performing firms clear due interest payments for two months, manage to switch, but resort to non-performance soon thereafter.

Overall our findings on switching as a result of lower loan rate offers, subsequent increases in loan rates due to informational lock-in, and the presence of adverse selection due to limited information sharing corroborate key elements in Sharpe (1990), Rajan (1992), von Thadden (2004), Hauswald and Marquez (2006), Jappelli and Pagano (1993), Padilla and Pagano (1997), and Padilla and Pagano (2000), for example.

¹ See Sharpe (1990), Rajan (1992), Hauswald and Marquez (2003), Bouckaert and Degryse (2004), von Thadden (2004), Black (2006b), Bouckaert and Degryse (2006), Egli, Ongena and Smith (2006), Hauswald and Marquez (2006), among others.

The rest of the paper proceeds as follows. Section II reviews the literature. Section III introduces the data, Section IV the methodology, and Section V the results. Section VI concludes.

II. Literature

We are obviously not the first to study bank-firm relationships and switching.² For example, an extensive set of papers studies the impact of relationship duration on loan rates. Many of these studies run reduced-form regressions of the cost of credit for the borrowing firms on the duration of bank-firm relationships, typically controlling for a variety of other relationship, firm, bank, and market characteristics. The results in these studies seem rather mixed. In their seminal paper studying the cost of 371 US credit lines, Berger and Udell (1995) find that the spread between the cost of credit and the prime rate decreases by almost ten basis points per relationship year. On the other hand, Elsas and Krahnert (1998) find no effect in their sample of 353 German credit lines, while Degryse and Van Cayseele (2000) find that the loan yield, in their sample of 17,429 loan contracts, increases by almost eight basis points per relationship year.

A potential problem in all of these studies is that the composition of the pool of borrowers may change over (relationship) time as banks get to know their customers better and favor certain types. Controls in cross-sectional studies may fail to capture these dynamic effects. Hence, differences in the average duration across studies may complicate any comparison and interpretation. We aim to address this issue by

² See Berger and Udell (2002), Boot (2000), Ongena and Smith (2000) and Degryse and Ongena (2006), among others, for reviews.

dynamically comparing conditions on new loans obtained by firms that turn to a new bank with firms that keep the same set of banks at the time of the switch, and before and after its occurrence.

Other potential issues in this line of research include the possible joint character of the loan decision, loan fees and cross-selling. Most studies implicitly assume the loan collateral and maturity decision to be taken either independently or sequentially after the loan granting decision but before the determination of the loan rate. If collateral and loan maturity are important, ignoring the possible joint character of the loan decision, may bias the findings (Brick, Kane and Palia (2004); Ortiz-Molina and Penas (2006); Berger, Espinosa-Vega, Frame and Miller (2005)). By matching on collateral and loan maturity, we do not need to assume anything about the decision process. Most studies also ignore loan fees (Hao (2003)) and the pricing implications of cross-selling (Liberti (2004)). To address these issues, we match on bank, time, type of loan, relative loan volume of the lender and the scope of the bank relationship.

Another set of papers has recently started to explore the impact of relationship, firm, bank, and market specific characteristics on the probability of switching bank. Ongena and Smith (2001) and Farinha and Santos (2002), for example, find that the likelihood a firm replaces a relationship increases in duration. The number of bank relationships the firm maintains also negatively influences the length of a relationship. These and other studies also find that young, small, high-growth, intangible, constrained, or highly leveraged firms switch bank faster *ceteris paribus*, but that there are some notable exceptions (Degryse and Ongena (2006)). A limitation of most of these studies is their use of annual data and, as a result, their lack of focus on what actually happens right

before and after the switch. In contrast, we have access to monthly data to analyze precisely how loan conditions and behavior are affected around the time of the switching.

III. Data

We study the *Central de Información e Riesgos Crediticios* (CIRC), the public credit registry of Bolivia that is managed by the Bolivian Superintendent. This unique database contains detailed loan contract information, on a monthly basis, on all outstanding loans granted by banks operating in the country. The banking sector is the principal source of capital for most firms, as the capital markets are not well developed (Sirtaine, Skamnelos and Frank (2004)).

We focus on commercial loans to firms and in particular on new loan initiations between 1999:03 and 2003:12.³ Analyzing only new loans allows us to employ up-to-date and comparable borrower and contract information at the precise time borrowers “switch” to a new bank. Motivated by theory that models the impact of switching on the conditions of standard debt contracts, we focus on the initiations of installment and single payment loans, which comprise 94% (66%) of the total dollar value (number) of loans initiations in our sample and for which the likelihood of repayment is mostly firm-not transaction-specific (as is the case with discount documents, for example).

The largest bank operating in Bolivia is *Banco Santa Cruz*, with around 1.4 billion US\$ in assets, represents around 20% of total bank assets in the beginning of our sample

³ The sample starts in 1999:03 because prior to this date we cannot distinguish between commercial and consumer loans.

period.⁴ Five other banks have assets of more than 0.5 billion US\$. The Herfindahl-Hirschman Index (HHI) measuring concentration in outstanding bank debt (new loan initiations) equals 1,335 (1,427) in the beginning of our sample period, and never exceeds 1,587 (2,334).⁵ On the other hand, there is substantial regional variation in concentration. For example, in the small regions outside *La Paz*, *Cochabamba*, and *Santa Cruz* (which account for more than 90% of all loan initiations), the HHI varies between 3,000 and 7,000.

During the sample period there are 33,084 loan initiations of installment and single payment loans to 2,805 firms, of which 59% are corporations and 37% are partnerships or sole proprietorships. The corporations in our sample are much larger than the partnerships or sole proprietorships. For example, at sample entry the average (median) corporation has \$600,000 (\$80,000) in bank debt outstanding, while the average (median) partnership or sole proprietorship has only \$290,000 (\$50,000).⁶ Nearly 25% of the firms in our sample are in the retail trade industry, 18% are manufacturing firms, and 11% are real estate firms. The manufacturing firms are the largest firms in our sample; their average (median) bank debt outstanding equals \$807,000 (\$150,000).

⁴ de Dreu and Ioannidou (2006), who study the impact of the introduction of deposit insurance on market discipline in Bolivia, provide an overview of all banks operating in the country between 1998 and 2003.

⁵ The Herfindahl-Hirschman Index equals the sum of the percentage market shares squared.

⁶ As information on total firm assets is not available, we approximate firm size using total bank debt. Using data from the Survey of Small Business Finances for the United States, Petersen and Rajan (1994) find that conditional on the existence of institutional debt, the ratio of bank debt to total debt does not vary significantly with firm size. For firms with less than \$15,000 in total assets, this ratio is equal to 51% while for firms with more than \$2,000,000 in total assets the ratio equals 62%. As capital markets are less developed in Bolivia than in the United States this ratio may vary even less, such that total bank debt is most likely highly correlated with firm size.

Overall, our sample firms do not differ much from the Survey of Small Business Finances (SSBF) used in Petersen and Rajan (1994), for example.

Only one-fifth of our sample firms have multiple bank-lending relationships and there is a positive correlation between firm size and the number of relationships. For example, the median firm with multiple relationships is in the top 15% of the bank debt outstanding. This pattern is again consistent with findings from other countries (Petersen and Rajan (1994) for the United States, Harhoff and Körting (1998) for Germany, Degryse and Van Cayseele (2000) for Belgium, Ongena and Smith (2001) for Norway, and Farinha and Santos (2002) for Portugal).

IV. Methodology

We define a new loan a *switch* (or a *switching loan*) when a firm obtains a new loan from a bank it did not have a lending relationship with during the last 12 months. We call such banks *outside banks* and in effect conservatively assume that key inside information can get stale as quickly as within one year. All banks with a lending relationship with the firm during the last 12 months, we call *inside banks*. A lending relationship can include any form of used or unused credit, including credit cards, credit lines, overdrafts, and discount documents. To study the switching loans we also require that the firm borrowed from at least one other bank during the last 12 months.

Among the 33,084 loan initiations of installment and single payment loans, there are 1,062 switching loans granted to 615 firms. 77% of the switchers are corporations and 20% are partnerships or sole proprietorships. Hence corporations seem more prone to switching. But even after conditioning on legal structure, switchers are larger than the

other firms in our sample. The average (median) corporation that switches has \$1,087,090 (\$153,000) in bank debt, almost double the amount of the other corporations. Similarly, switching partnerships or sole proprietorships have \$753,227 (\$150,000) in bank debt, almost triple the amount of the other partnerships and sole proprietorships. On the other hand, the distribution of switchers across industries is very similar to the overall sample: 27% of the switchers are in retail trade, 21% in manufacturing, and 11% in real estate.

Approximately 64% of the switchers have a single bank-lending relationship, as opposed to 79% for the overall sample. This is consistent with the hypothesis that switchers tend to be larger firms. In fact, firms that switched more than once during the sample period are even larger. Among the 615 firms, 64% switched only once, 20% switched twice, and 16% switched more than two times.

V. Results

We study first the conditions under which the firms switch. In particular, we compare loan rates on the switching loans with rates on new loans in the same month to other comparable firms from both inside and outside banks, and study how these relative rates developed before and after switching. We will also study the relative quality of the switchers before and after the switch.

A. Loan Rates and Switching

We start by analyzing the loan rate at the time of the switch by matching new switching loans to other new loans from the inside banks. Figure 1 displays the matching scheme. Recall that if a firm hasn't borrowed from a bank during the last year, we call this bank

an *outside bank* and a new loan from this bank we call a *switching loan*. Our testing strategy has three steps: (1) We match each switching loan with all similar new loans from the inside banks during the last month (see Table 1 for a description of the variables we match on); (2) We take the spreads between the rates on the switching loans and each matched loan; (3) We regress the spreads on a constant and cluster errors at the firm level.

Matching on bank, loan, and firm characteristics is essential to identify the effects of switching on loan rates. Table 2 already illustrates that switchers reduce their loan rate by 28*** basis points (bp),⁷ but also that switchers are more likely, than non-switchers, to obtain a single large installment loan with a short maturity, to have a better rating, to be incorporated, and to pledge collateral, for example.

Table 3 presents the matching variables, the number of observations, the coefficient on the constant in this regression, the robust standard error, and the resulting significant level (at which the null hypothesis that the coefficient equals zero can be rejected). Matching on time (year/month), bank, currency denomination, loan type, and credit rating by the new bank, leaves 69,235 observations and 1,001 switching loans, suggesting that for every switching loan there are on average 69 “comparable” loans from inside bank(s) (Model I). The coefficient on the constant in the regression indicates that loan rates on the switching loans are 81*** bp below rates on comparable new loans from the inside banks. Matching further on region, economic activity, and

⁷ As in the tables, *, **, and *** indicate significance at the 10%, 5% and 1% levels, two-tailed.

legal structure of the firm (Model II) reduces the sample to 2,923 observations. The spread remains a significant -51^{***} bp.

Next, we replace the credit rating by the new bank with the worse credit rating by the inside banks in Model III. The credit rating by the outside bank is possibly biased in favor of the switcher and this bias could explain our finding of a negative spread (we will return to this issue later in the paper). Hence, we also match on the credit ratings given by the inside banks. We report only the matching with the worst observed inside rating (matching on the best or average rating yields very similar results and thus we do not to report them). We are left with 2,367 observations and an average spread of -57^{***} bp.

In Model IV we weigh each observation by the total number of inside loans obtained by the borrower and rerun the regression value-weighted. The average spread remains -41^{**} bp. In Model V, we further match on collateral, loan maturity, and loan size. The number of observations drops to 1,163 and the average spread to -86^{***} bp. Finally, we match on the number of bank relationships (Multiple Bank Relationships), the relative loan volume (Primary Lender), and the Scope of the Bank Relationship. We are left with only 279 observations but the spread remains significantly negative at -69^* bp.

To conclude, our matching exercises suggests that switchers can obtain a substantially lower loan rate at their new bank than at any of their current inside lenders. We find these results in line with the switching behavior arising in von Thadden (2004), for

example, where outside banks acquire new borrowers by offering lower loan rates.⁸ Next, we study the evolution of the loan rates before and after switching.

B. Loan Rates Before and After the Switch

In Table 4 we match the switching loans with other new loans from the new outside bank according to the same matching schedule as in Table 3. Results are surprisingly similar, with spreads varying between -37^{**} and -91^{***} basis points. These findings suggests that the outside banks are not different from the current inside banks of the switcher in their pricing behavior vis-à-vis their other customers. Switching itself gives the firm an “edge”, but the “discount” the switcher receives seems to fade over time (as the other comparable customers of the outside banks on average have to pay more).

To explore this issue further we regress the loan rate of subsequent new loans obtained by the switching firm from the outside bank on the duration of the relationship since the time of the switch (*Number of Months After the Switch*). However once a firm switches (or acquires a new relationship) the “old” inside bank may update its probability of loosing this firm and itself becomes more aggressive in pricing, offering lower loan rates. Because in the beginning of a relationship the informational advantage of the outside bank may be limited, the outside bank may have to offer additional rate cuts, on

⁸ Our own simulations and Black (2006b) suggest that for reasonable parameter values, loan rates can be lower for switchers than for non-switchers in von Thadden (2004). Barone, Felici and Pagnini (2006), using Italian 2004-2005 credit survey data, find that rates decrease between 25 and 123 bp following a switch. Black (2006a) using around 600 loans from the SSBF finds that interest rates on outside loans are around 40 bp higher than loans from existing banks. However they do not study, as we do, the development of the rates before and after switching.

top of the initial discount, in order to keep the new customer.⁹ To capture this possibility, we also include both the term “duration squared” and the number of bank relationships. We further include loan (amount, proportion of loan collateralization, maturity, type), relationship (multiple, primary lender, scope), and firm characteristics (legal structure, rating, region, activity), bank identity, and year/month dummies as control variables. We observe 4,206 subsequent new loans to switchers from the outside bank. The estimation results are reported in Table 5, Model I.

Both coefficients on duration are statistically significant at a 1% level. The duration of the relationship since the switch is in months, hence the coefficients in Model I in Table 5 indicate that the loan rate decreases another 35 bp in the first 17 months after the switch, and then starts increasing.¹⁰ The 35-bp drop itself is also statistically different from zero at a 1% level of significance. The loan rate differential climbs back to zero after 34 months, and reaches +50 bp after 44 months following the switch.

Figure 2 displays the resulting loan rate pattern. Switching reduces rates by around 50 bp. Anchoring the path of the loan rates to the 50 bp drop as a result of the switching shows the rates back equal to zero almost four years after the switch. The estimated median length of an observed relationship is actually around six years, suggesting that once the median firm starts paying “hold-up rents”, it switches again to another bank.¹¹

⁹ Though not explicitly modeled, additional rate cuts seem consistent with the general model intuition in von Thadden (2004).

¹⁰ We find the length of this period during which the bank collects additional inside information similar to the one-year period in Cole (1998).

¹¹ The average switching rate for all (active loan initiating) firms equals 10.6% (13.6%). The resulting median duration is more than six (five) years, assuming constant duration dependence, comparable in

Next, rather than looking forward, we trace the loan rate backward from the moment the firm switched and construct a variable measuring the duration of the relationship as the number of months before the switch. We basically rerun the same specification as before, of course now employing as the dependent variable the loan rate on new loans granted to the firm in the months before its switch “at time zero”. The coefficients on the duration variables are reported in Model II in Table 5. The coefficients are significant and economically meaningful. Three years before switching the firm pays a rate that is around 21 bp lower than the rate right just before switching (see also Figure 2). Going back further in time loan rates drop even further.

Next we subject our results to a number of robustness checks. For example, we replace the Multiple Bank Relationship dummy by the number of relationships. Results are unaffected and not reported. We also add the average Interest Rate of the other Non-Switching Loans in Model I and report the results in Model III of Table 5. For this specification, we had to drop switchers that have only one lender (since our new variable is not defined for this group of borrowers) and the Multiple Bank Relationship dummy (since it is collinear with the constant term for this sub-sample). The sample almost halves to 2,358 but the coefficients on the duration variables are virtually unaffected. We also add the inside bank’s total exposure to this specification. Results are broadly unaffected and not reported. Finally, we interact the two duration variables with a firm credit rating dummy that equals one if the firm has the best rating. Estimates suggest the

magnitude to estimates for small and/or *de novo* firms in Portugal (Farinha and Santos (2002)), Belgium (Degryse and Van Cayseele (2000)), and Germany (Lehmann and Neuberger (2001)), for example.

drop and consequent rise in rates occurs quicker and is more pronounced for the badly rated firms.

To conclude, our regressions analyzing loan rates after and before switching suggest that firms pay a substantially higher loan rate the longer they borrow from the same inside bank. Over an interval of four years before and four years after the switch (and ignoring the drop in rates as a result of the switch) rates increase by 17 bp per year.¹² We find these results in line with the informational lock-in present in Sharpe (1990), Rajan (1992), and von Thadden (2004), for example. Next, we study the characteristics of the switchers.

C. Who Switches?

Table 6 reports the credit ratings of the firms engaging a new bank. Column I tabulates the ratings by the new (outside) banks given to the switchers. The outside banks assess a remarkable 97% of all switchers to be of the highest credit quality, i.e. with a rating equal to one. In contrast, Column II displays the contemporaneous ratings given by inside banks to all new loans given to other firms at the time the switchers move. The distribution is different. For example, inside banks think only 87% of their borrowers are of the highest credit quality. A percentage that is still quite high, but the Kolmogorov-Smirnov test (KS) for the equality of the two populations reported in the last row of the Table rejects the null hypothesis of equality between the two

¹² Rates remain constant for example in D' Auria, Foglia and Reedtz (1999), Elsas and Krahnert (1998), Harhoff and Körting (1998) and Petersen and Rajan (1994) and increase by around 8 bp per *relationship year* in Degryse and Van Cayseele (2000), 11 bp in Degryse and Ongena (2005), and more than 40 bp in Pozzolo (2004). However, none of these papers study the loan rates around switching. See also Degryse and Ongena (2006) for more discussion of these and other findings.

distributions. In addition, comparing the loan rate between the two groups (Column I – II), we find that switchers consistently (though not always statistically significantly) pay a lower loan rate than the firms staying with the inside banks. For all firms the difference is 27*** bp, broadly confirming our earlier matching results (though the characteristics of both groups may now obviously differ).

But are switchers really of such a high quality to warrant the higher credit rating and hence the lower loan rate? We think this is possibly the case, but with some interesting qualifications. We start by comparing the switchers' rating by the outside banks with the last rating they received from their inside bank (Column III). Only 84.5% of firms received the best rating from the inside bank prior to switching. The KS test indicates this distribution is also not equal to the rating distribution by the outside banks (but the KS test cannot reject the equality between the former distribution and the contemporaneous inside bank ratings). Hence according to the given ratings, switchers are not different from, or even slightly worse in quality, than the average non-switcher. But maybe the inside banks don't adequately recognize the quality of the would-be switchers, charging them too high interest rates and giving them a good reason to switch.

Hence, Figure 3 compares the repayment history of the switchers and the non-switchers in the period before and after switching. The results suggest switchers are indeed better performers. Between five to three months before the actual switch only 8% of switchers don't perform (i.e., they have overdue payments). In contrast, 23% of the other firms don't perform. Banks can receive up to two months of credit information on a firm from the credit register but can only request information on an individual firm if the firm actively seeks to engage the bank. Hence, it is likely that the outside bank will not have

credit information from this earlier [-5, -3] period (unless the firm would have approached the bank before which we think is unlikely). Consequently, firms that want to switch but don't perform may want to improve during the [-3, -1] period. In fact, more than half (27/50) of the switchers become performing during this critical period, while only 14% of the non-switchers starts to perform during this period.

Of course, it is possible that switchers can't keep up this performance after switching. This may be indeed be the case as respectively 59% and 68% of the non-performing switchers in the two periods after the switch were actually performing in the [-3, -1] period before the switch, while only 21% and 28% of the non-performing other firms were. This last result also suggests that outside banks have an informational disadvantage over inside banks. Most of the non-performers of the outside banks are firms for which they had no adverse information prior to the switch. Instead, the vast majority of non-performers in inside banks are firms with prior known problems. On the other hand, overall non-performance of switchers continues to equal a low 8 % in the [1,3] and 12 % in the [3, 5] period after the switch. In contrast, 24% and 29% of the other firms are non-performing during these periods.

To conclude, switchers are on average better performing firms with a good reason to switch, i.e. they are charged an interest rate that is too high. Most of the switchers are permanently performing better, but some of the switchers only perform better during the two-month period prior to the switch (the period covered by the credit register if the outside bank requests credit information).

While the outside banks suffer from asymmetric information and ensuing adverse selection, the outside banks are also aware of their informational disadvantage. Indeed,

while both the contemporaneous and the past inside ratings are reflected in a statistically significant and economically relevant way in the loan rate (we simply regress the average loan rate on a constant and the rating), this is not the case for the ratings given by the outside banks. Hence, it seems the outside banks don't even bother trying to rate the new customers initially: they simply give most firms the top rating and a lower loan rate.

Overall, we find these results in line with the winner's curse present in Rajan (1992), von Thadden (2004), and Black (2006b), for example. The information-sharing regime assures that overall only performing firms can switch, a result in line with general theoretical priors (Jappelli and Pagano (1993), Padilla and Pagano (1997), and Padilla and Pagano (2000)). But some non-performers, that "can pull it off", mix with the performers during the two-month period prior to switching by temporarily putting up good appearances by making their due interest payments. Outside banks attract firms by indiscriminately offering lower loan rates, but start increasing loan rates a year and a half thereafter.

VI. Conclusion

We study a unique database containing all loan initiations in Bolivia in the period 1999-2003 to document the dynamic pattern of conditions and behavior that arises around switching. Turning to a new bank substantially lowers the loan rate, around 50 basis points at switching time followed by an additional 35 basis points on new loans obtained within the next year and a half. Around that time however the new (now "inside") bank starts increasing its loan rate offered to that borrower, slowly at first but eventually at a pace of more than 30 basis points per year. After around four years the

switching firm is back to where it started, i.e. the loan rate charged by the new bank now equals again what the switcher obtained from its inside banks before switching. Consequently the firm will eventually, when its observable financial performance makes it possible, start looking for more favorable conditions at other banks.

The behavior by the outside banks that attract the switchers is a distinct feature of this loan rate cycle. The outside banks bestow its top credit rating on virtually the entire pool of new customers; in contrast, the current lenders of the firm grade discriminately to arrive at an appropriate loan rate.

The information-sharing regime in place allows the outside banks to attract mostly performing firms. However, as the credit information available in the credit register covers at most two months prior to an information request by a potential lender, the outside banks seemingly still suffer from adverse selection. As a result some “bad” non-performing firms clear due interest payments for two months, manage to switch, but resort to non-performance again soon thereafter.

Overall our findings suggest lower loan rates upon switching, subsequent increases in loan rates due to informational lock-in, and the presence of adverse selection due to limited information sharing, corroborating key elements in recent theoretical banking models. More empirical research seems warranted to investigate more deeply the effects of key institutional characteristics on the documented loan rate patterns and bank behavior.

FIGURE 1. SWITCHERS, INSIDE AND OUTSIDE BANKS

The figure displays the definition of switchers, inside and outside banks. Firm A switches to bank 3 if the firm obtains a new loan from bank 3 and the firm has not borrowed anything from bank 3 during the last 12 months. Banks 1 and 2 are the inside banks if firm A did obtain new loans from banks 1 or 2 during the last 12 months.

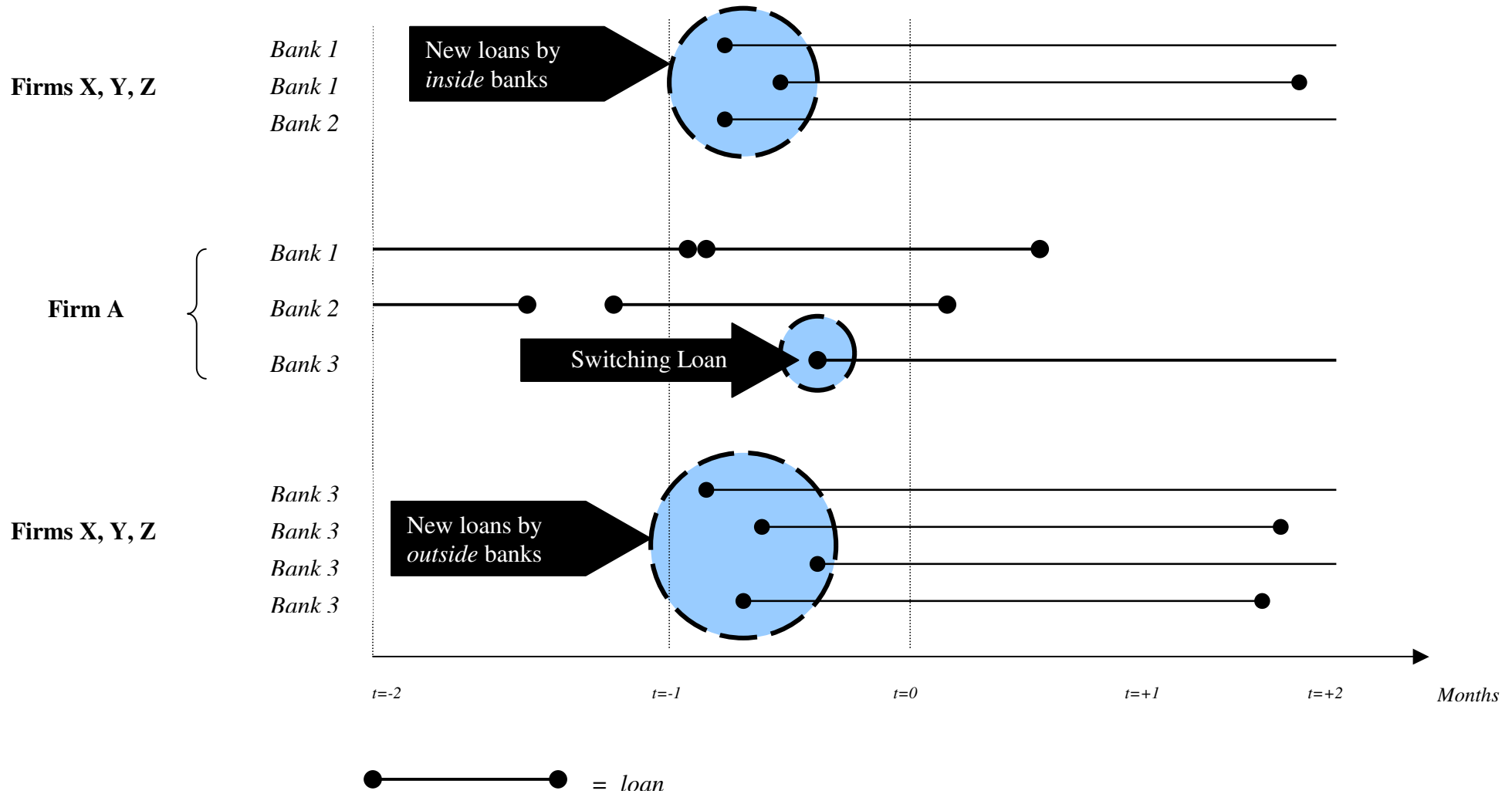


FIGURE 2. SPREAD BEFORE AND AFTER SWITCHING

The figure displays the spread (in basis points) between the interest rate on new loans obtained by the switcher and interest rates on loans obtained by matched firms from inside or outside banks. The evolution of the spread before (after) the switch is based on regressions of loan rates on terms capturing duration before (after) the switch and a set of control variables. The vertical dashed line indicates the median length of relationships in the sample.

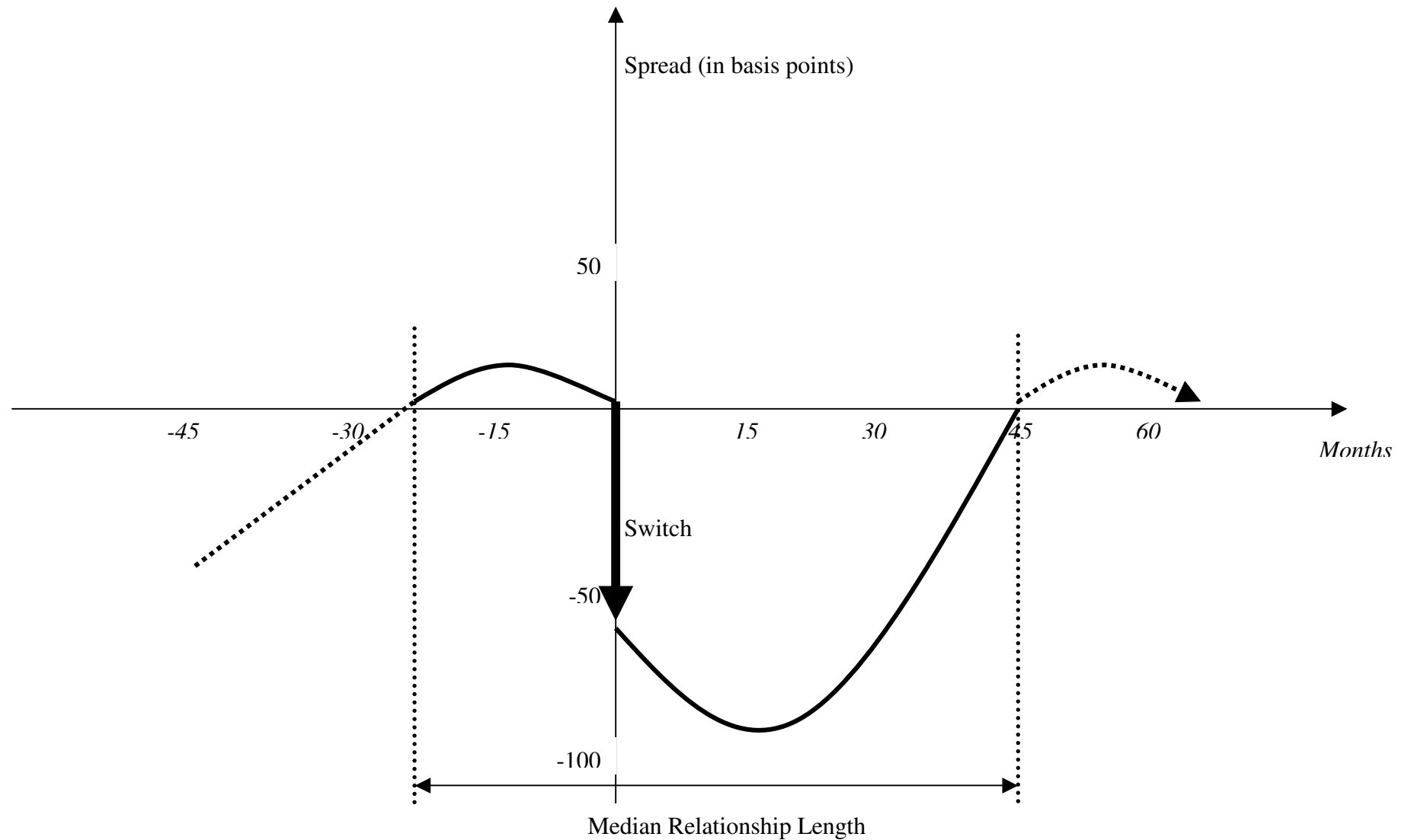


FIGURE 3. INFORMATION SHARING AND NUMBER OF SWITCHERS WITH NON-PERFORMING LOANS

The figure displays the number of switchers and non-switchers with non-performing and performing loans.

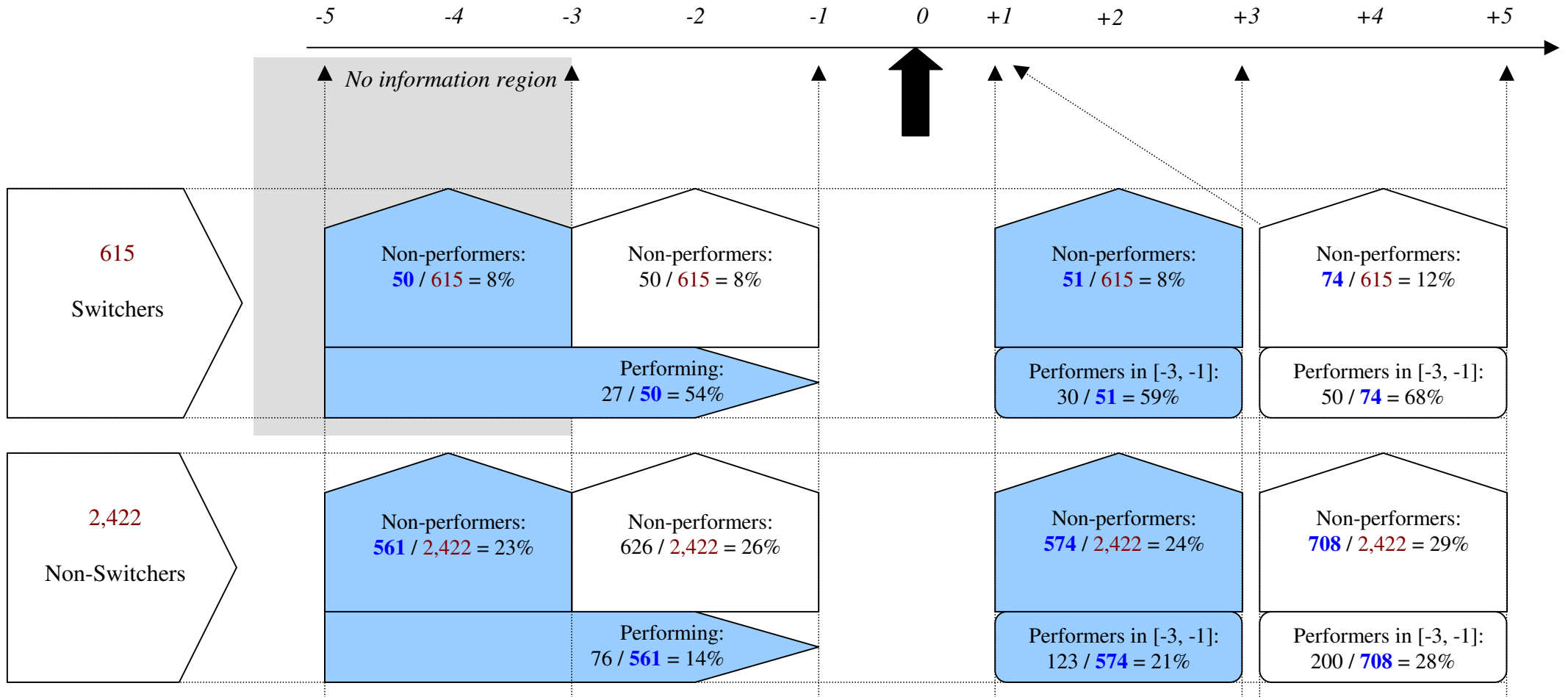


TABLE 1. MATCHING VARIABLES

The table reports the number of possible values (#) and a range (or list) of values for the matching variables.

Matching Variables	#	Possible Values
Year : Month	58	1999:03 – 2003:12.
Inside Bank	2	= 1 if the firm had a lending relationship with a bank in the last 12 months and = 0 otherwise.
Outside Bank	2	= 1 if the firm did not have a lending relationship with a bank in the last 12 months and = 0 otherwise.
Currency Denomination	2	Bolivian Pesos, US Dollars.
Loan Type	2	Single Payment Loan, Installment Loan.
Credit Rating	5	No Problems (= 1), Potential Problems, Unsatisfactory, Doubtful, Write off (= 5).
Worse Credit Rating by Inside Bank(s)	5	No Problems (= 1), Potential Problems, Unsatisfactory, Doubtful, Write off (= 5).
Region	13	Chuquisaca, La Paz, Cochabamba, Oruro, Potosi, Tarija, Santa Cruz, Beni, Pando, U.S.A, Argentina, Paraguay, Panama.
Economic Activity	18	Agriculture and cattle farming; Forestry and fishery; Extraction of oil and gas; Minerals; Manufacturing; Electricity, gas, and water; Construction; Wholesale and retail trade; Hotels and restaurants; Transport, storage, and communications; Financial intermediation; Real estate activities; Public administration, defense, and compulsory social security; Education; Communal and personal social services; Activities of households as employees of domestic personnel; Activities of extraterritorial organizations and bodies; Other activities.
Legal Structure	4	Sole proprietorships; Partnerships (i.e., all or some partners have unlimited liability); Corporations (i.e., all partners have limited liability); Other (includes public companies, municipalities, social, cultural, sport, and religious associations).
Proportion of Loan Collateralized	2	= 1 if the matched loans have similar ratios of collateral value to loans size and = 0 otherwise. To define similar ratios we use a window of (-30%, +30%).
Loan Maturity	2	= 1 if the matched loans have similar maturity using a (-30%, +30%) window.
Loan Amount	2	= 1 if the matched loans have similar contract amount using a (-30%, +30%) window.
Multiple Bank Relationships	2	= 1 if the firm has outstanding loans with more than one bank and = 0 otherwise.
Primary Lender	2	= 1 if the value of loans from a bank is at least 50% of the firm's loans and = 0 otherwise.
Scope of the Bank Relationship	2	= 1 if the firm has additional products (i.e., credit card used or not used, overdraft used or not used, and discount documents) with a bank and = 0 otherwise.

TABLE 2. SELECTED CHARACTERISTICS OF SWITCHERS AND NON-SWITCHERS

The table reports the mean, the standard deviation, and the median for selected loan and firm characteristics. The unit of observation in this table is the number of loan initiations for switching and non-switching loans respectively. The summary statistics for the *Proportion of Loan Collateralized* are calculated for the sub-sample of loans that are collateralized. In the last two columns we test the equality of the two means and median. For the means we use the Student's t-test. For the medians we use the Wilcoxon-Mann-Whitney test, except for categorical variables where we employ the more appropriate Pearson's Chi-square test. *, **, and *** indicate significance at the 10%, 5%, and 1% levels respectively.

Variables	Switchers			Non-Switchers			Difference			
	Mean	St. deviation	Median	Mean	St. Deviation	Median	Mean		Median	
Installment Loans (in %)	56.03	49.66	100	46.74	49.89	0	9.29	***	100	***
Loans Denominated in US\$ (in %)	96.23	19.05	100	98.02	13.94	100	-1.78	***	0	*
Credit Rating	1.04	0.27	1	1.17	0.51	1	-0.13	***	0	***
Worse Credit Rating by Inside Bank(s)	1.29	0.63	1	
Sole Proprietorships (in %)	4.90	21.59	0	12.83	33.44	0	-7.93	***	0	***
Partnerships (in %)	11.68	32.13	0	14.35	35.06	0	-2.67	***	0	**
Corporations (in %)	80.60	39.56	100	70.75	45.49	100	9.86	***	0	***
Interest Rate (in bp)	1,328	396	1,370	1,356	301	1,400	-28.08	***	-30	***
Collateral (in %)	40.67	49.14	0	23.27	42.25	0	17.41	***	0	***
Proportion of Loan Collateralized	193.11	251.89	123.52	611.75	6,929.79	129.91	-418.64		-6.39	
Loan Maturity (in months)	11.20	17.67	5.98	18.20	25.84	5.90	-7.00	***	0.08	***
Loan Amount (in US\$)	331,329	825,600	80,000	155,670	439,586	41,000	175,659	***	39,000	***
Multiple Bank Relationships (in %)	82.39	38.11	100	54.00	49.84	100	28.39	***	0	***
Primary Lender (in %)	40.30	49.07	0	72.75	44.52	100	-32.45	***	-100	***
Scope of Bank Relationship (in %)	3.11	17.36	0	27.60	44.70	0	-24.49	***	0	***
Number of Observations		1,062			32,022					

TABLE 3. SPREADS BETWEEN INTEREST RATES ON SWITCHING LOANS AND RATES ON MATCHED LOANS GIVEN BY INSIDE BANKS

We assess the spread between the interest rate on a switching loan and the interest rates on new loans obtained (by other firms) from inside banks. We match on the indicated variables. We regress the spreads on a constant, cluster at the switching firm level, and report robust standard errors between parentheses. *, **, and *** indicate significance at the 10%, 5% and 1% levels, two-tailed.

Matching Variables	I	II	III	IV	V	VI
Year : Month	Yes	Yes	Yes	Yes	Yes	Yes
Bank	Yes	Yes	Yes	Yes	Yes	Yes
Currency Denomination	Yes	Yes	Yes	Yes	Yes	Yes
Loan Type	Yes	Yes	Yes	Yes	Yes	Yes
Credit Rating	Yes	Yes				
Worse Credit Rating by the Inside Banks			Yes	Yes	Yes	Yes
Region		Yes	Yes	Yes	Yes	Yes
Economic Activity		Yes	Yes	Yes	Yes	Yes
Legal Structure		Yes	Yes	Yes	Yes	Yes
Proportion of Loan Collateralized					Yes	Yes
Loan Maturity					Yes	Yes
Loan Amount					Yes	Yes
Multiple Bank Relationships						Yes
Primary Lender						Yes
Scope of the Bank Relationship						Yes
Value-weighted by Borrower/Inside Bank Loans				Yes	Yes	Yes
Number of Observations	69,235	2,923	2,367	2,367	1,163	279
Number of Switching Loans	1,001	496	445	445	283	135
Spread in Basis Points	-81.39 *** (14.89)	-51.33 *** (17.97)	-56.60 *** (20.74)	-40.92 ** (20.17)	-85.61 *** (19.77)	-69.41 *** (25.30)

TABLE 4. SPREADS BETWEEN INTEREST RATES ON SWITCHING LOANS AND RATES ON MATCHED LOANS GIVEN BY OUTSIDE BANKS

We assess the spread between the interest rate on a switching loan and the interest rates on new loans obtained (by other firms) from outside banks. We match on the indicated variables. We regress the spreads on a constant, cluster at the switching firm level, and report robust standard errors between parentheses. *, **, and *** indicated significance at the 10%, 5% and 1% levels, two-tailed.

Matching Variables	I	II	III	IV	V	VI
Year : Month	Yes	Yes	Yes	Yes	Yes	Yes
Bank	Yes	Yes	Yes	Yes	Yes	Yes
Currency Denomination	Yes	Yes	Yes	Yes	Yes	Yes
Loan Type	Yes	Yes	Yes	Yes	Yes	Yes
Credit Rating	Yes	Yes				
Worse Credit Rating by the Inside Banks			Yes	Yes	Yes	Yes
Region		Yes	Yes	Yes	Yes	Yes
Economic Activity		Yes	Yes	Yes	Yes	Yes
Legal Structure		Yes	Yes	Yes	Yes	Yes
Proportion of Loan Collateralized					Yes	Yes
Loan Maturity					Yes	Yes
Loan Amount					Yes	
Multiple Bank Relationships						Yes
Primary Lender						Yes
Scope of the Bank Relationship						Yes
Value-weighted by Borrower/Outside Bank Loans				Yes	Yes	Yes
Number of Observations	28,659	2,028	1,578	1,578	735	177
Number of Switching Loans	1,029	505	425	425	262	100
Spread in Basis Points	-40.68 *** (13.64)	-37.30 ** (18.87)	-51.89 ** (22.64)	-60.31 *** (8.90)	-91.48 *** (17.73)	-68.17 *** (24.67)

TABLE 5. INTEREST RATES ON LOANS BY SWITCHERS

The table lists the coefficients from regressions with the *loan rate* (in basis points) on: (I) subsequent loans from the outside bank(s), and (II) on loans from the inside bank(s) before the switch. The independent variables are the *Number of Months After/Before the Switch*, *Loan Amount* (in millions of US Dollars), *Proportion of Loan Collateralized*, *Loan Maturity* (in months), *Multiple Bank Relationships*, *Primary Lender*, and *Scope of the Bank Relationship*. In specification (III) we add the *Average Interest Rate of Non-Switching Loans* to specification I. This variable is undefined if there are no outstanding inside loans (hence we have to drop Multiple Bank Relationships and loose half of our sample). For both specifications we include *Loan Type*, *Firm Legal Structure*, *Credit Rating*, *Region*, *Economic Activity*, *Bank Identity*, and *Month/Year* dummy variables. We employ ordinary least squares estimation. *, **, and *** indicate significance at the 10%, 5%, and 1% level, two-tailed.

Matching Variables	I		II		III	
Number of Months After the Switch	-4.12	***			-4.47	***
	(0.97)				(0.13)	
(Number of Months After the Switch) ²	0.12	***			0.12	***
	(0.02)				(0.02)	
Number of Months Before the Switch			1.19	**		
			(0.61)			
(Number of Months Before the Switch) ²			-0.05	***		
			(0.01)			
Proportion of Loan Collateralized	3.65	*	2.85	**	7.70	*
	(1.95)		(1.26)		(4.21)	
Loan Maturity	-0.78	***	0.23		-0.65	*
	(0.24)		(0.22)		(0.38)	
Loan Amount	-85.60	***	-85.20	***	-61.50	***
	(10.80)		(9.62)		(9.80)	
Multiple Bank Relationships	-39.56	***	-30.99	***		
	(9.33)		(5.92)			
Primary Lender	-16.51	*	10.71	*	-4.19	
	(8.67)		(6.08)		(9.77)	
Scope of the Bank Relationship	-22.43	**	7.38		-20.23	
	(10.15)		(5.26)		(14.44)	
Average Interest of Non-Switching Loans					0.25	***
					(0.02)	
<i>Loan Type, Legal Structure, Credit Rating, Region, Economic Activity, Bank Identity, and Month/Year dummy variables are included</i>	<i>Yes</i>		<i>Yes</i>		<i>Yes</i>	
Number of Observations	4,206		6,423		2,358	
R-Squared	0.62		0.52		0.61	

TABLE 6. RATINGS AND LOAN RATES BY INSIDE AND OUTSIDE BANKS

The table lists (I) the ratings of the switcher by the new (outside) bank(s) at the time of the switch, (II) the contemporaneous ratings by all inside banks of all new loan initiations at the time of the switch, and (III) the latest ratings of the switcher by the inside banks. The first column of the table lists the ratings (1=best, 5=worse). The columns in each panel report the number of *Observations*, the percentage (%) observations and the mean (and standard deviation) of the *Loan Rate* in each rating class, in percent. The panel I-II lists the difference in loan rates, in basis points, and the significance level of an F-statistic for a test for the equality of means. The Kolmogorov-Smirnov (KS) test for the equality of the two populations is reported in the last row (*Appler: Arsham (2006)*). *, **, and *** indicate significance at the 10%, 5%, and 1% level, two-tailed.

	I			II			I - II	III			
	Ratings by New (Outside) Bank(s)			Ratings by All Inside Banks				Latest Ratings by Inside Bank(s)			
Ratings	Observations	%	Loan Rate	Observations	%	Loan Rate	Rate Diff.	Observations	%	Loan Rate	
1	1,030	97.0	13.2 (3.9)	27,864	87.0	13.4 (3.0)	-10	900	84.8	13.1 (4.1)	
2	26	2.5	13.3 (3.0)	3,216	10.0	14.3 (2.3)	-98 **	127	12.0	14.1 (2.4)	
3	2	0.2	12.4 (2.2)	690	2.2	15.0 (2.9)	-262	23	2.2	13.7 (1.9)	
4	3	0.3	14.3 (2.8)	113	0.4	15.7 (2.1)	-146	4	0.4	18.0 (4.2)	
5	1	0.1	0.1 (-)	139	0.4	19.3 (5.8)	-	8	0.8	11.7 (6.5)	
Total	1,062	100.0	13.2 (3.9)	32,022	100.0	13.6 (3.0)	-27 ***	1,062	100.0	13.2 (3.9)	
				KS Test: I vs II			0.09 ***	KS Test: I vs III			0.12 ***
								KS Test: II vs III			0.02

REFERENCES

- Arsham, H., 2006. "Statistical Thinking for Managerial Decisions," University of Baltimore, Website.
- Barone, G., R. Felici, and M. Pagnini, 2006. "Switching Costs in Local Credit Markets," Banca d'Italia, Mimeo.
- Berger, A.N., M. Espinosa-Vega, W.S. Frame, and N.M. Miller, 2005, "Debt Maturity, Risk, and Asymmetric Information," *Journal of Finance* 60, 2895-2924.
- Berger, A.N., and G.F. Udell, 1995, "Relationship Lending and Lines of Credit in Small Firm Finance," *Journal of Business* 68, 351-381.
- Berger, A.N., and G.F. Udell, 2002, "Small Business Credit Availability and Relationship Lending: The Importance of Bank Organisational Structure," *Economic Journal* 112, 32-53.
- Black, L., 2006a. "An Empirical Analysis of Insider Rates vs. Outsider Rates in Bank Lending," Federal Reserve Board, Mimeo.
- Black, L., 2006b. "Insider Rates vs Outsider Rates in Bank Lending," Federal Reserve Board, Mimeo.
- Boot, A.W.A., 2000, "Relationship Banking: What Do We Know?," *Journal of Financial Intermediation* 9, 3-25.
- Bouckaert, J., and H. Degryse, 2004, "Softening Competition by Inducing Switching in Credit Markets," *Journal of Industrial Economics* 52, 27-52.
- Bouckaert, J., and H. Degryse, 2006, "Entry and Strategic Information Display in Credit Markets," *Economic Journal* 116, 702-720.
- Brick, I.E., E. Kane, and D. Palia, 2004. "Evidence of Jointness in the Terms of Relationship Lending," Rutgers Business School, Mimeo.
- Cole, R., 1998, "The Importance of Relationships to the Availability of Credit," *Journal of Banking and Finance* 22, 959-977.
- D' Auria, C., A. Foglia, and P.M. Reedtz, 1999, "Bank Interest Rates and Credit Relationships in Italy," *Journal of Banking and Finance* 23, 1067-1093.
- De Dreu, J., and V.P. Ioannidou, 2006. "The Impact of Explicit Deposit Insurance on Market Discipline," Tilburg University, Mimeo.
- Degryse, H., and S. Ongena, 2005, "Distance, Lending Relationships, and Competition," *Journal of Finance* 60, 231-266.
- Degryse, H., and S. Ongena, 2006. "Competition and Regulation in the Banking Sector: A Review of the Empirical Evidence on the Sources of Bank Rents," CentER - Tilburg University, Mimeo.
- Degryse, H., and P. Van Cayseele, 2000, "Relationship Lending Within a Bank-Based System: Evidence from European Small Business Data," *Journal of Financial Intermediation* 9, 90-109.
- Egli, D., S. Ongena, and D.C. Smith, 2006, "On the Sequencing of Projects, Reputation Building, and Relationship Finance," *Finance Research Letters* 3, 23-39.
- Elsas, R., and J.P. Krahnert, 1998, "Is Relationship Lending Special? Evidence from Credit-File Data in Germany," *Journal of Banking and Finance* 22, 1283-1316.
- Farinha, L.A., and J.A.C. Santos, 2002, "Switching from Single to Multiple Bank Lending Relationships: Determinants and Implications," *Journal of Financial Intermediation* 11, 124-151.
- Hao, L., 2003. "Bank Effects and the Determinants of Loan Yield Spreads," York University, Mimeo.
- Harhoff, D., and T. Körting, 1998, "Lending Relationships in Germany - Empirical Evidence from Survey Data," *Journal of Banking and Finance* 22, 1317-1353.
- Hauswald, R., and R. Marquez, 2003, "Information Technology and Financial Services Competition," *Review of Financial Studies* 16, 921-948.
- Hauswald, R., and R. Marquez, 2006, "Competition and Strategic Information Acquisition in Credit Markets," *Review of Financial Studies* 19, 967-1000.
- Jappelli, T., and M. Pagano, 1993, "Information Sharing in Credit Markets," *Journal of Finance* 63, 1693-1718.
- Lehmann, E., and D. Neuberger, 2001, "Do Lending Relationships Matter? Evidence from Bank Survey Data in Germany," *Journal of Economic Behavior and Organization* 45, 339-359.
- Liberti, J.M., 2004. "Initiative, Incentives and Soft Information: How Does Delegation Impact the Role of Bank Relationship Managers?," Kellogg School of Management Northwestern, Mimeo.
- Ongena, S., and D.C. Smith, 2000, "Bank Relationships: a Survey," in P. Harker, and S. A. Zenios, eds.: *The Performance of Financial Institutions* (Cambridge University Press, London), 221-258.
- Ongena, S., and D.C. Smith, 2001, "The Duration of Bank Relationships," *Journal of Financial Economics* 61, 449-475.

- Ortiz-Molina, H., and M.F. Penas, 2006. "Lending to Small Businesses: The Role of Loan Maturity in Addressing Information Problems," University of British Columbia, Mimeo.
- Padilla, A.J., and M. Pagano, 1997, "Endogenous Communication among Lenders and Entrepreneurial Incentives," *Review of Financial Studies* 10, 205-236.
- Padilla, A.J., and M. Pagano, 2000, "Sharing Default Information as a Borrower Discipline Device," *European Economic Review* 44, 1951-1980.
- Petersen, M.A., and R.G. Rajan, 1994, "The Benefits of Lending Relationships: Evidence from Small Business Data," *Journal of Finance* 49, 3-37.
- Pozzolo, A.F., 2004. "The Role of Guarantees in Bank Lending," Ente Luigi Einaudi, Mimeo.
- Rajan, R.G., 1992, "Insiders and Outsiders: the Choice between Informed and Arm's-length Debt," *Journal of Finance* 47, 1367-1400.
- Sharpe, S.A., 1990, "Asymmetric Information, Bank Lending and Implicit Contracts: a Stylized Model of Customer Relationships," *Journal of Finance* 45, 1069-1087.
- Sirtaine, S., I. Skamnelos, and S. Frank, 2004. *Bolivia: Challenges in the Corporate and Banking Sectors* (Worldbank, Washington DC).
- Von Thadden, E.L., 2004, "Asymmetric Information, Bank Lending, and Implicit Contracts: the Winner's Curse," *Finance Research Letters* 1, 11-23.