

“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 firms and banks through an extended period of time. As a result, we can document the full dynamic cycle of bank loan conditions, firm repayment behavior, and bank rating before and after firms switch banks. Our findings suggest that a new loan granted by an outside bank, that was not engaged by the firm before, carries a loan rate that is more than 80 basis points lower than the rates on comparable new loans from its current inside banks. 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 firm obtained from its former inside banks before switching. Independently of the loan rate, switching also involves increasing loan maturity and loan size. Maturity shortens again afterwards. Although the information-sharing regime in place allows the outside banks to attract mostly firms that repay, outside banks still suffer from adverse selection because the credit information available is limited to two months prior to their information request. A distinct feature of the loan condition cycle is that outside banks attribute the best rating to almost 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.

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, 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 firm 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 bank loan conditions, firm repayment behavior, and bank rating of firms that arises has not been documented before, as far as we know. Our findings suggest that a new loan granted by an outside bank— a bank that was not engaged by the firm before— carries a loan rate that is more than 80 basis points lower than the rates on comparable new loans from its current inside banks (independently, loan maturity and loan size also increase). And it doesn't stop there. Upon switching, the new bank is willing to decrease loan rates by another 35 basis points within the next year and a half.

However one year and a half after the switch, the bank starts hiking the loan rates, slowly at first but eventually at a clip of more than 30 basis points per year (independently, loan maturity also shortens again). 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, presumably when receiving a better offer, the firm may switch bank again nevertheless.

The existence of a public credit registry helps banks to select performing from non-performing applicants (in terms of repayment). However banks still suffer from adverse selection, given that the credit history available is limited to two months prior to an information request. As a result some firms clear due payments for two months, manage to switch, but resort to non-performance soon thereafter.

Overall our findings document that (1) switching involves lower loan rates and more advantageous other loan conditions, (2) loan rates subsequently increase and maturity shortens possibly due to informational lock-in, and (3) despite information sharing between banks, adverse selection is present due to the limited, two-month, sharing horizon. These findings comprehensively corroborate key predictions in theoretical models analyzing bank-firm relationships and information sharing between banks.¹

A distinct feature of the loan condition cycle is the behavior of the outside banks. The new banks attribute their best credit rating to virtually the entire pool of all new

¹ For models analyzing bank-firm relationships see, among others, Fischer (1990), Sharpe (1990), Rajan (1992), von Thadden (2004), Hauswald and Marquez (2006), Egli, Ongena and Smith (2006), Black (2006b). On information sharing see Jappelli and Pagano (1993), Padilla and Pagano (1997), Padilla and Pagano (2000), Bouckaert and Degryse (2004), and Bouckaert and Degryse (2006), among others.

customers. In contrast, the current lenders of the firm grade discriminately to determine a loan rate and they charge higher rates to those with worse ratings.²

The rest of the paper proceeds as follows. Section II reviews the literature. Section III introduces the data and provides some descriptive statistics. Section IV describes the methodology, and Section V the results and robustness checks. Section VI concludes.

II. Literature

We are obviously not the first to study bank-firm relationships and switching.³ Recent papers explore the impact of relationship, firm, bank, and market characteristics on the probability of switching bank and the impact of relationship duration on loan rates.

In von Thadden (2004) bank relationships arise even in a competitive loan market because the incumbent bank has the ability to offer only loans above-cost to its best customers and 'hold up' customers from receiving competitive financing elsewhere. The inside bank gains this monopoly power through its informational advantage over the other, outside banks. A high-quality firm that attempts to switch to a competing uninformed bank gets pooled with low-quality firms and is offered an even worse, break-even interest rate. Consequently low-quality firms switch more often than high-quality ones. Holdup costs are also present in Rajan (1992), since in his model the bank has the power to withdraw financing when it perceives the firm to be inadequately managed.

² Uninformed loan officers at the outside banks conceivably could have an incentive to attribute the best rating to all new firms to secure internal funding. See, for example, Stein (2002) and Liberti (2004) for an analysis of the incentives of loan officers to collect different types of information.

³ See, among others, Berger and Udell (2002), Boot (2000), Ongena and Smith (2000), and Degryse and Ongena (2006) for reviews.

This degree of control can be costly because it reduces the incentives of the firm manager to exert effort.

Motivated by these models, Ongena and Smith (2001) and Farinha and Santos (2002), for example, study relationship duration. They 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, *ceteris paribus*, young, small, high-growth, intangible, constrained, or highly leveraged firms switch bank faster, but that there are some notable exceptions (see Degryse and Ongena (2006) for a review). A limitation of most of these studies is their use of annual data and, as a result, their lack of focus on what happens right before and after the switch. In contrast, we have access to monthly data to analyze how loan conditions and behavior are affected around the time of the switching.

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 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.

Additional problems in this aforementioned line of research include the possible joint character of the loan decision, loan fees, and cross-selling. Most studies implicitly assume that the loan collateral and maturity decisions are 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 and Palia (2006); 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, in addition to matching on collateral and loan maturity when investigating loan rates we also match on bank, time, type of loan, relative loan volume of the borrower, and the scope of the bank relationship. However, using the same methodology we also analyze the development of other loan conditions around switching to obtain a comprehensive picture.

III. Data

We study data collected by the *Central de Información de 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 since capital markets are not well developed (Sirtaine, Skamnelos and Frank (2004)). Moreover, most (if not all) firms do not have access to credit derivatives. Hence, to rearrange interest payments, firms will have to renegotiate with their current bank or switch. Finally, banks are prohibited from owning non-financial firms (Barth, Caprio and Levine (2006)).

The analysis focuses on commercial loans to firms and in particular on new loan initiations between 1999:03 and 2003:12.⁴ Analyzing only new loans allows us to employ up to-date and comparable firm and contract information at the precise time firms “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, which represents around 20% of total bank assets in the beginning of our

⁴ The sample starts in 1999:03 because prior to this date we cannot distinguish between commercial and consumer loans.

sample period.⁵ 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).⁶ On the other hand, there is substantial regional variation in concentration. For example, in the small regions outside the three large regions (*La Paz, Cochabamba, and Santa Cruz*) the HHI varies between 3,000 and 7,000.⁷

During the sample period there are 33,084 loan initiations of installment and single payment loans to 2,805 firms,⁸ 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).⁹ 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).

⁵ 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.

⁶ The Herfindahl-Hirschman Index equals the sum of the percentage market shares squared.

⁷ The three large regions account for more than 90% of all loan initiations.

⁸ Implying that during the 57 months sample period firms take out 11.7 new loans, i.e., a new loan every 4.8 months. The median loan maturity is less than six months.

⁹ 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 (e.g., 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 with which it did not have a lending relationship 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. As we aim to compare the loan conditions from the outside with those of the inside bank, we will not retain or analyze the few firms that did not obtain any bank funds during the last 12 months.

While our choice of 12 months can be motivated by empirical findings suggesting that a substantial portion of the bank's inside information is collected during the first year (Cole (1998) for example), we also check our results for 24 and 36-month windows.

While the number of observations we can employ decreases (given the extension of the time-requirement), the results are not affected and we choose not to report them.

Our definition of switching does not differentiate between those firms that replace or “shift” between banks and those firms that “add” a bank relationship. First, we think that investigating under what conditions a firm obtains a loan from another bank and not from one of its existing lenders is the most interesting question.¹⁰ Second, given the relatively high frequency of our data and investigation, it is hard to operationalize a meaningful differentiation between shifting and adding without also considering using future and hence possibly endogenous information. For example, both “shiffters” with a few remaining outstanding loans and “adders” renewing loans with an inside bank a few months later will be misclassified. In addition, firms may reverse their initial shifting or continuation decisions, making reliance on future information to correct this classification problem rather treacherous.

Third, despite these concerns we investigate switchers that do not have loans outstanding in the month of the switch (the “shiffters”) versus those that do have contemporaneous loans outstanding (the “adders”). While the 20% of the switchers that shift obtain somewhat smaller, more expensive, more collateralized, and longer maturity loans than the “adders”, the results we report in the remainder of the paper on the conditions surrounding the switch are mostly not distinguishable for both groups (and consequently we choose not to report them).

¹⁰ The long run causes or effects of shifting versus adding a relationship may differ, for example, for *de novo* firms (Farinha and Santos (2002)) or firms that switch following bank mergers (Degryse, Masschelein and Mitchell (2006)).

Given our definition of switching (with the 12-month horizon and no differentiation between shifting and adding), there are 1,062 switching loans granted to 615 firms, among the 33,084 loan initiations of installment and single payment loans. 77% of the switchers are corporations and 20% are partnerships or sole proprietorships. Hence corporations seem more prone to switch. 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 non-switching corporations. Similarly, switching partnerships or sole proprietorships have \$753,227 (\$150,000) in bank debt, almost triple the amount of non-switching 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.

In addition, 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 first study 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.¹¹ We also study the other loan conditions and the repayment performance of the switchers before and after the switch.

A. Switching and Loan Rates

1. *Matching Scheme*

We start by analyzing the loan rate on switching loans. We match switching loans with loans given by the switcher's inside banks to other firms at the time of the switch (remember that we study only new loans). 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 switcher's inside banks at the time of the switch (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. Although, Table 2 already illustrates that rates on switching

loans are 28*** basis points (bp) lower than rates on non-switching loans, there are other differences between the two groups that could justify the lower rates.¹² For example, switching loans are more likely (than non-switching loans) to have shorter maturities, be collateralized, have installments instead of a single-payment at maturity, and to be given to firms that are incorporated with better ratings.

2. Results

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 firm 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 the set of inside banks (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 legal structure of the firm (Model II) reduces the sample to 2,923 observations. The spread, however, remains a significant –51*** bp.

Next, we replace the firm 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 switchers and this bias could explain our finding of a negative spread (we

¹¹ Connecting confounding events to loan initiations is currently impossible given the monthly reporting frequency and the lack of reliable data sources.

¹² As in the tables, *, **, and *** indicate significance at the 10%, 5% and 1% levels, two-tailed.

will return to this issue later in the paper). Hence, we also match on the most recent 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 report them). We are left with 2,367 observations and an average spread of -57^{***} bp.

In Model IV we weigh each observation by one over the total number of inside loans obtained by the firm 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 (we consider Model V our benchmark model). The number of observations drops to 1,163 and the average spread to -86^{***} bp. Such a drop is not trivial: the average loan rate during the sample period is 13.56% or 1,356 bp, with a standard deviation of 305 bp, and the average bank spread is 966 bp, with a standard deviation of 145 bp.¹³

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 loan rate behavior at switching in Rajan (1992) and von Thadden (2004), for example, where outside banks acquire new borrowers by offering lower loan rates.¹⁴

¹³ Bank spreads are equal to the average ex-ante loans rates minus the average deposit rates.

¹⁴ Our own simulations and Black (2006b) suggest that for reasonable parameter values, loan rates in von Thadden (2004) can also be lower *on average* for switchers than for non-switchers. Barone, Felici and Pagnini (2006), analyzing 78,907 observations from a 2004-2005 Italian credit survey data, find that rates are between 25 and 123 bp lower after a switch. Black (2006a) on the other hand, analyzing 600 SSBF loans, finds that interest rates on outside loans are on average 40 bp higher than loans from existing banks. However neither study analyzes, as we do, the development of rates before and after switching by matching new loan initiations on multiple bank, loan, and firm characteristics.

3. *Robustness*

Next, we subject our benchmark Model V to a wide array of robustness exercises. In Table 3 Model VI, for example, we match on the number of bank relationships (Multiple Bank Relationships), the relative loan volume (Primary Lender), and the Scope of the Bank Relationship. While we are left with only 279 observations, the spread remains significantly negative at -69^* bp. Starting again from Model V, we also match on total amount of outstanding debt, a proxy for firm size. Again results are unaffected. As mentioned earlier, we also replace the 12-month horizon that defines an inside-relationship by 24 and 36-month horizons, respectively, and study firms that shift versus firms that add relationship(s). The results are mostly unaffected and not reported.

A general downward drift in interest rates combined with bank loan rate stickiness could motivate firms to switch and could explain our results. Figure 2a displays the interest rates on the three-month, US dollar denominated, Bolivian T-Bills, and the average rate on the switching and non-switching (US dollar denominated) loans. Figure 2b records the number of loan initiations for each month in our sample and the corresponding number of switching loans. While interest rates drop significantly between 2000:12 and 2002:03, there is no increase in the level or proportion of switching loans during that period. We further investigate the loan rate spreads using the line-up of matching exercises in Table 4 for the three periods delineated by the 2000:11 and 2002:04-vertical lines in Figure 2, but fail to find any systematic differences between the three periods. Given that the results are very similar, regardless of whether interest rates are falling or are varying around a constant trend, suggests that not simply picking up price-stickiness on non-switching loans.

Individual banks trying to gain market share may also drive our results. We start by studying bank market shares over time. As we cannot identify any bank that significantly gains market share or consistently offers abnormally low loan rates, we study whether banks temporarily run “sales campaigns” to spur switching (banks may aim to price discriminate heterogeneous firms in this way). We define a sales campaign as a month during which a bank attracts a number of switchers that exceeds two times the standard deviation of the number of switchers it receives in all of the preceding months during the sample period. We identify 37 campaign months.¹⁵ Removing campaign months from the sample does not alter the results. Hence, we choose not to report them.

Finally, during the sample period there were a few bank failures. There was one failure in 1999:03 (the starting point of our sample) and two in the second half of 1998. Some of the assets of the failed banks were transferred to two other banks in the sample. However, removing the involved banks from the sample or the firms that had lending relationship with the failed banks does not alter the results.

B. Loan Rates Before and After the Switch

1. Matching with Loans from Outside Banks

In Table 4 we match the switching loans with all other loans from the outside bank that granted the switching loan. Again we analyze only new loans and we use the same matching schedule as in Table 3. Results are surprisingly similar, with spreads varying

¹⁵ If we use the entire sample period to determine the standard deviation for each bank, we are still left with 32 campaign months. Note that both definitions of campaign months are specific to the bank (i.e., a given month is classified a campaign month for one bank but not for another).

between -27^{**} and -96^{***} basis points. We subject the matching exercises in Table 4 to the same line-up of robustness checks as in Table 3 and find no differences.¹⁶

Overall, these findings suggests that the outside banks are not different from the switcher's current inside banks 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).

Maybe it shouldn't come as a surprise that, after having lured the firm with an attractive offer, the outside banks start behaving like inside banks. While outside banks acquire new borrowers by offering lower loan rates in Rajan (1992) and von Thadden (2004), inside banks increase their loan rates over time in these models. Having documented the robustly lower loan rate of switching loans, to complete the picture we now investigate the path of loan rates at the inside banks before and after switching.

2. *Loan Rates After the Switch*

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 after a firm switches

¹⁶ Differentiating between outside foreign and domestic banks, we find for Model V, for example, that the 69 “foreign switch loans” carry a 130^{***} bp rate cut (178 matched loans), while the 180 “domestic switch loans” get a statistically significant lower cut of only 82^{***} bp (547 matched loans). Foreign banks may have access to cheaper deposits (see de Dreu and Ioannidou (2006)) and/or cherry-pick firms along dimensions that are unobservable to us. We also study the 329 switching loans given to firms borrowing from failing banks. As indicated earlier, removal of these loans does not affect our main findings. Their spread varies between 44^{***} and -29 bp (we match with loans obtained by firms from non-failing outside banks), as bank failure may compel firms to switch at short notice under less advantageous conditions. We leave both topics for future research.

(or acquires a new relationship) the “old” inside bank may update its probability of losing this firm and itself becomes more aggressive in pricing, offering lower loan rates. Because in the beginning of a relationship the outside bank may still be at an informational disadvantage, the outside bank may have to offer additional rate cuts, on top of the initial discount, in order to keep the new customer.¹⁷ To capture this possibility, we also include the “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. We employ ordinary least squares estimation, cluster at the firm level, and report robust standard errors between parentheses. The estimation results are reported in Table 5, Model I.

Both coefficients on duration are statistically significant at the 5 and 10% level respectively. 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 drops 20 bp in the first six months,¹⁸ decreases in total 35 bp in the 17 months after the switch,¹⁹ and then starts

¹⁷ Though not explicitly modeled, additional rate cuts may be consistent with the general model intuition in von Thadden (2004).

¹⁸ This decrease itself is significant at the 10% level.

¹⁹ Athavale and Edmister (2004), studying 3,388 individual loan contracts offered by a single US bank between 1990 and 1996, also find that rates on the second subsequent loan carries rates that are between 15 and 35 bp lower than the rates on the first loan with the incumbent bank. However, rates on the third loan do not differ from the rates on the second loan.

increasing.²⁰ The loan rate differential climbs back to zero after 34 months, and reaches +85 bp after four years following the switch.

Figure 3 displays the resulting loan rate pattern. Switching itself involves a reduction in rates by around 85 bp (estimates Table 3 Model V). Anchoring the path of the loan rates to the 85 bp drop as a result of the switching shows the rate differential returns back to zero four years after the switch. The estimated median length of an observed relationship is actually around six years,²¹ suggesting that once the median firm starts paying “hold-up rents”, it switches again to another bank.

3. *Robustness*

Next we subject our results to a number of robustness checks. For example, we replace the duration variables by a set of fixed-period dummies (we checked both a set of 6-month and 12-month dummies). In both cases we observe a statistically significant and economically relevant decrease and then increase in loan rates following the switch. We further replace the Multiple Bank Relationship dummy by the actual number of relationships. Results are unaffected and not reported. We also add the average Interest Rate of the other Non-Switching Loans (reported in Model II of Table 5). For this specification, we drop switchers that have only one lender since our new variable is not defined for this group of firms. We also drop the Multiple Bank Relationship dummy since it is collinear with the constant term for this sub-sample. The sample almost

²⁰ The length of this period during which the bank may be collecting additional inside information seems similar to the one-year period documented in Cole (1998).

²¹ 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

halves to 2,358, but the magnitude of the coefficients on the duration variables is virtually unaffected (though only the squared term remains significant). Finally, we also add the inside bank's total exposure to this specification. Like before, the results are broadly unaffected and thus are not reported.

4. *Interactions*

We interact the two duration variables with a number of key variables to gain further confidence in the relevancy of our results (results apply both to Models I and II). Take regional market concentration, measured monthly by the sum of individual bank market shares of outstanding loans squared, i.e. an *HHI* measure. Estimates on the interaction between this measure and the two duration variables suggest that loan rates drop and increase significantly less in more concentrated markets (i.e., there is a less pronounced cycle in more concentrated markets). If concentration measures the intensity of competition, this result would conform predictions in Sharpe (1990) and Rajan (1992)²².

We also interact a *frequent switcher dummy* (i.e., a dummy that equals one if the time since the last switch is shorter than the sample median length of a relationship) with the duration variables. Estimates on these interactions suggest that loan rates drop and increase less for frequent switchers. Outside offers may be drawn from a distribution with a lower support, i.e. there may be a floor value for the outside loan rate (as in von Thadden (2004) for example), while the lock-in period of frequent switchers may be too short to reach its maximum.

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

Finally, estimates of the coefficients on the interactions with the *firm's credit quality* (i.e., a dummy that equals one if the firm has the best credit rating) suggest a more pronounced cycle for badly rated firms (i.e., a larger initial drop and faster subsequent increases). We consider these findings compatible with the equilibrium modeled in von Thadden (2004).

5. *Loan Rates Before the Switch*

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.²³ 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 III in Table 5. The coefficients are economically meaningful though only the squared term is marginally significant. 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 3). Going back further in time loan rates drop even further.

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,

²² See also results in Shaffer (1998).

which is consistent with the mixed findings in the existing empirical literature.²⁴ We find these results in line with the informational lock-in present in Sharpe (1990), Rajan (1992), and von Thadden (2004), for example.

C. Other Loan Conditions?

Other loan conditions may be determined jointly (e.g., Brick and Palia (2006)) and not prior to the loan interest rate as assumed in the regressions in Table 5. Hence, we rerun Model I of Table 5 after dropping the three loan characteristics (i.e., *Proportion of Loan Collateralized*, *Loan Maturity*, and *Loan Amount*). We report the duration coefficients in Table 6, Column I in the lowest panel. The results are virtually unaffected.

Next, we investigate the change in these three loan characteristics around switching. We match on all previously employed variables now including the *Loan Interest Rate* (using 30% bands for the match). The results are reported in the rest of Table 6 (we repeat the matching results of Model 3-V for the interest rate in Column I). Switching loans are more collateralized, have longer in maturity and are larger in size. While the maturity on future outside loans decreases again after the switch (see lowest panel), the other two loan characteristics do not change in a statistically significant way.

²³ As bank-firm relationships have different lengths, the number of months before the switch is at best a noisy measure of relationship length.

²⁴ For example, rates remain constant 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). As mentioned earlier, none of these papers study the loan rates around switching. See also Degryse and Ongena (2006) for more discussion of these and other findings.

Overall switching initially involves seemingly better conditions (lower rates, longer maturity, larger amounts), but afterwards conditions tighten up again (rates increase and maturities decrease). Next, we study the characteristics of switchers.

D. Who Switches?

Table 7 reports the credit ratings of the firms engaging a new bank. Column I tabulates the ratings of switchers from the new (outside) banks. 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 the switcher's inside banks to all new loans to non-switchers. The distribution is different. For example, inside banks think only 87% of their firms 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 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 that 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 4 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 prior to switching. 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 only receive up to two months of credit information on a firm from the credit register,²⁵ and 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]

²⁵ Limiting "the amount of data made available for distribution to the financial institutions to the current month" is common in many countries (see Miller (2003), Table 1A.7, Column 3). Given the short time period involved, an optimal memory loss objective (Vercammen (1995)) may not explain such an

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, our findings suggest that switchers are on average better performing firms with a good reason to switch, i.e. they are offered a lower loan rate. 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 to try to rate the new customers initially: they simply give most firms the top rating and a lower loan rate.

institutional feature. Administrative cost and/or the immediacy of the regulatory objective, on the other hand, may be rationales for a short sharing window (we thank Martin Brown for this argument).

Overall, these results are in line with the winner's curse present in Rajan (1992), von Thadden (2004), and Black (2006b). The information-sharing regime assures that mostly only performing firms can switch, a result that is in line with general theoretical priors such as (Jappelli and Pagano (1993), Padilla and Pagano (1997), and Padilla and Pagano (2000)). Nevertheless 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 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 firm, 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 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.

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.

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 obtains a *switching loan* from bank 3, if firm A did not borrow from bank 3 during the last 12 months. We call firm A the *switcher* and bank 3 the *outside bank*. Banks 1 and 2 are the switcher's *inside banks*, if in the last 12 months firm A had at least one loan outstanding with these banks. The analysis in Table 3 compares the interest rate of the switching loan with comparable new loans from the switcher's inside banks, while the analysis in Table 4 compares the rate of the switching loan with comparable new non-switching loans from the outside bank.

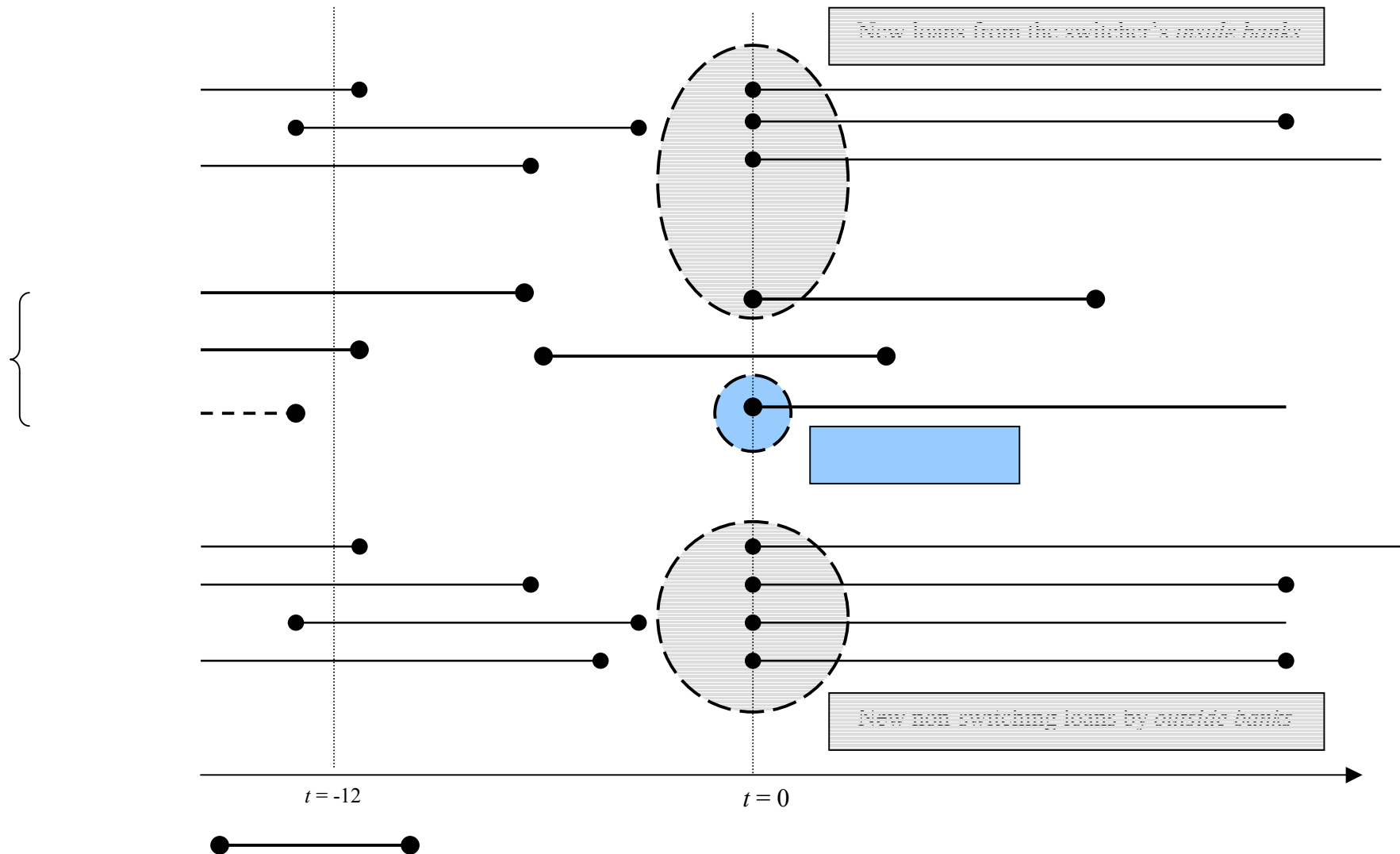


FIGURE 2. INTEREST RATES AND LOAN INITIATIONS

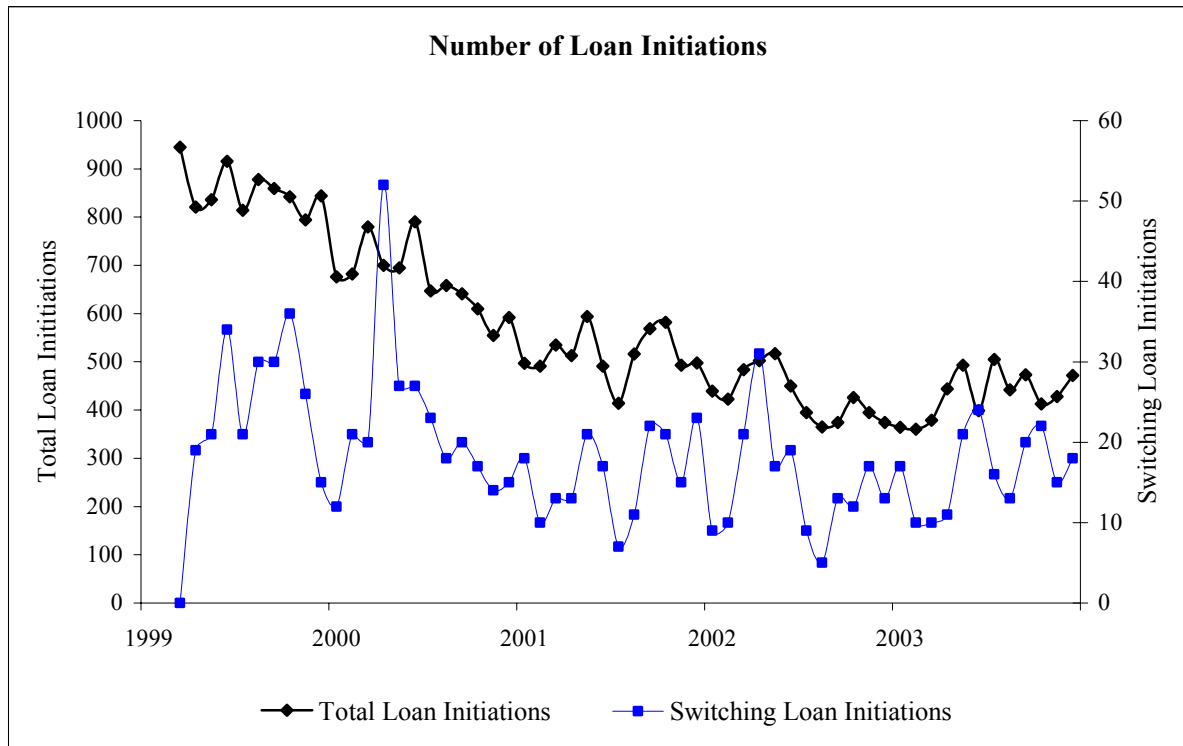
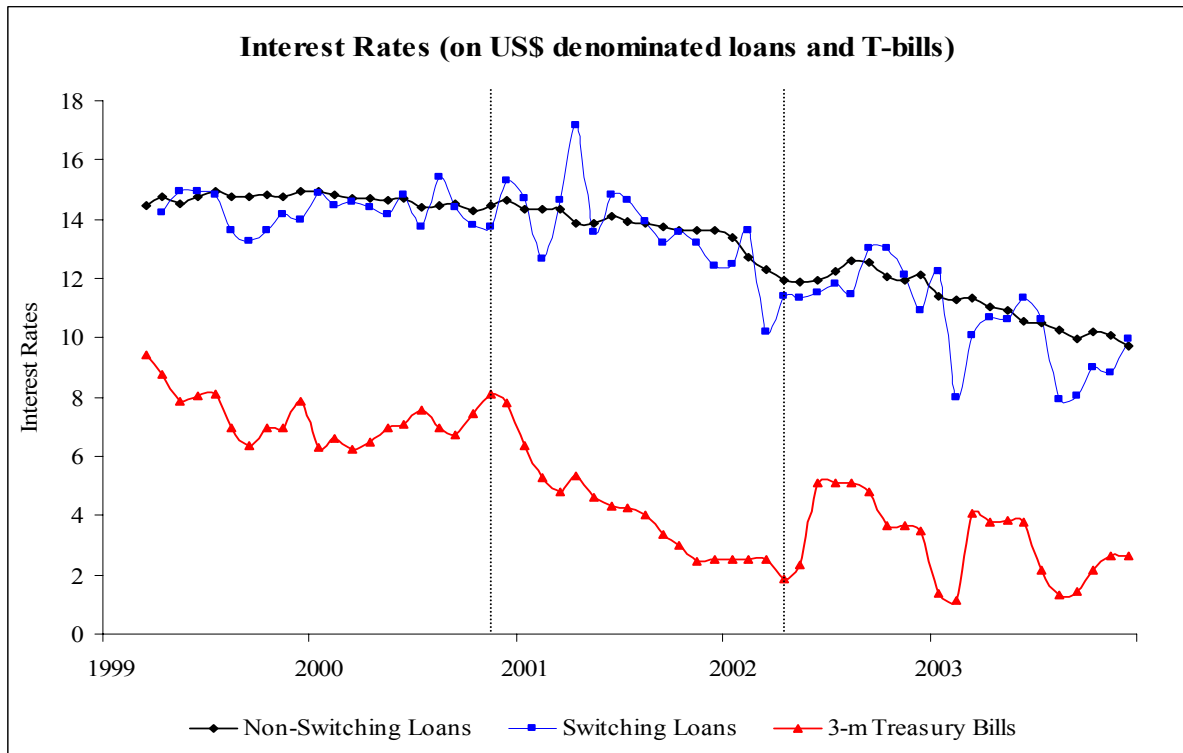


FIGURE 3. SPREAD BEFORE AND AFTER SWITCHING

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 estimated median length of relationships in the sample.

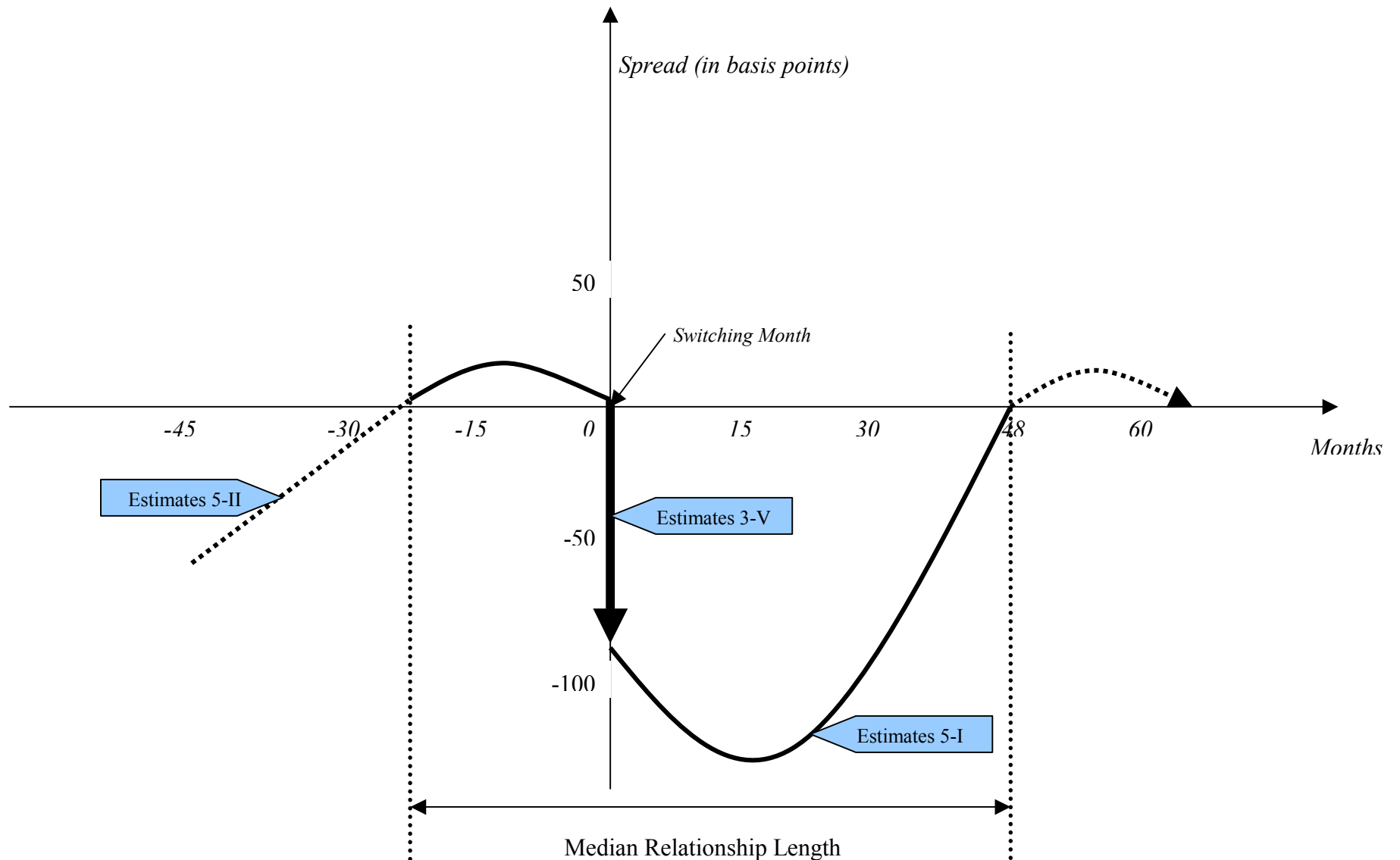


FIGURE 4. INFORMATION SHARING AND NUMBER OF SWITCHERS WITH NON-PERFORMING LOANS

The figure displays the number of switchers and non-switchers with non-performing and performing loans. The equality of the proportions between the various groups of switchers and non-switchers can always be rejected at the 1% level of significance using a standard Chi-2 test for the equality of population proportions (*Applet*: Arsham (2006)).

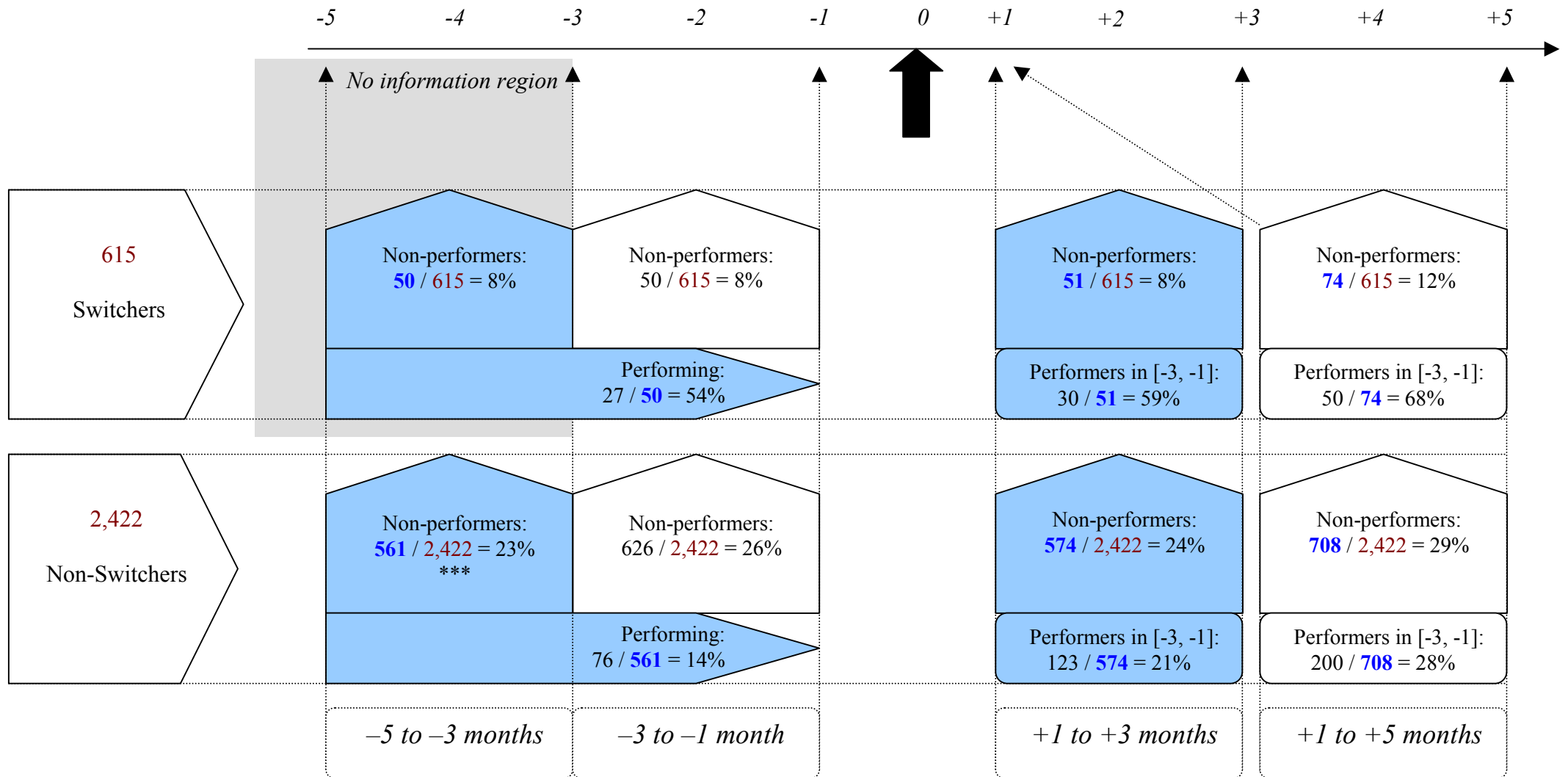


TABLE 1. MATCHING VARIABLES

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 SWITCHING LOANS AND NON-SWITCHING LOANS

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. We assess the differences in means using the Student's t-test and adjacent to the differences in medians report the significance of the outcome of the Wilcoxon-Mann-Whitney test (for categorical variables we report the more appropriate Pearson's Chi-square test). *, **, and *** indicate significance at the 10%, 5%, and 1% levels respectively.

| Variables | Switching Loans | | | Non-Switching Loans | | | 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 the switchers' set of 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 |
| Set of Inside Banks | 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 the individual outside bank. 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 |
| Individual Outside 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 | 28,983 | 2,015 | 1,581 | 1,581 | 725 | 159 |
| Number of Switching Loans | 1,032 | 493 | 408 | 408 | 249 | 90 |
| Spread in Basis Points | -36.02 *** (12.25) | -26.82 ** (18.43) | -49.04 ** (20.86) | -60.46 *** (17.05) | -96.01 *** (18.63) | -81.94 *** (25.88) |

TABLE 5. INTEREST RATES ON LOANS BY SWITCHERS

The table lists the coefficients from regressions with the *loan rate* (in basis points) on: (I and II) subsequent loans from the outside bank(s), and (III) on loans from the inside bank(s) before the switch. In specification (II) 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 lose half of our sample). 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*. All specifications include *Loan Type*, *Firm Legal Structure*, *Credit Rating*, *Region*, *Economic Activity*, *Bank Identity*, and *Month/Year dummy variables*. We employ ordinary least squares estimation, cluster at the firm level, and report robust standard errors between parentheses. *, **, 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 | |
| | (2.21) | (3.05) | |
| (Number of Months After the Switch) ² | 0.12 ** | 0.12 * | |
| | (0.05) | (0.06) | |
| Number of Months Before the Switch | | | 1.19 |
| | | | (1.11) |
| (Number of Months Before the Switch) ² | | | -0.05 ** |
| | | | (0.02) |
| Proportion of Loan Collateralized | 3.65 * | 7.70 * | 2.85 * |
| | (2.10) | (4.60) | (1.55) |
| Loan Maturity | -0.78 ** | -0.65 | 0.23 |
| | (0.37) | (0.53) | (0.28) |
| Loan Amount | -85.60 *** | -61.50 *** | -85.20 *** |
| | (22.00) | (16.70) | (14.50) |
| Multiple Bank Relationships | -39.56 * | | -30.99 ** |
| | (20.20) | | (13.08) |
| Primary Lender | -16.51 | -4.19 | 10.71 |
| | (20.84) | (14.45) | (11.77) |
| Scope of the Bank Relationship | -22.43 | -20.23 | 7.38 |
| | (18.17) | (22.83) | (10.49) |
| Average Interest of Non-Switching Loans | | 0.25 *** | |
| | | (0.05) | |
| <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 | 2,358 | 6,423 |
| R-Squared | 0.61 | 0.61 | 0.52 |

TABLE 6. DIFFERENCES IN LOAN CONDITIONS ON SWITCHING LOANS AND MATCHED LOANS GIVEN BY INSIDE BANKS

In Panel A we assess the difference in loan conditions on a switching loan and the conditions on new loans obtained (by other firms) from the switchers' set of inside banks. We match on the indicated variables. We regress the difference in conditions on a constant, cluster at the switching firm level, and report robust standard errors between parentheses. In Panel B we report the coefficients from regressions of the *loan condition* on subsequent loans from the outside bank(s) on the indicated independent variables. We employ ordinary least squares estimation, cluster at the firm level, and report robust standard errors between parentheses. *, **, and *** indicate significance at the 10%, 5% and 1% levels, two-tailed.

| Panel A: | I | II | III | IV |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------------------|--------------------|-------------------------|
| Matching Variables | Loan Interest Rate | Proportion of Loan Collateralized | Loan Maturity | Loan Amount |
| Year : Month, Set of Inside Banks, Currency Denomination, Loan Type, Worse Credit Rating by the Inside Banks, Region, Economic Activity, and Legal Structure | Yes | Yes | Yes | Yes |
| Loan Interest Rate | | Yes | Yes | Yes |
| Proportion of Loan Collateralized | Yes | | Yes | Yes |
| Loan Maturity | Yes | Yes | | Yes |
| Loan Amount | Yes | Yes | Yes | |
| Value-weighted by Borrower/Inside Bank Loans | Yes | Yes | Yes | Yes |
| Number of Observations | 1,163 | 1,080 | 1,335 | 1,319 |
| Number of Switching Loans | 283 | 274 | 314 | 321 |
| Difference in Loan Conditions | -85.61 *** (19.77) | 49.00 *** (16.65) | 9.84 *** (1.43) | 105,981 *** (36,584) |
| Panel B: | | | | |
| Number of Months After the Switch | -4.12 * (2.27) | -1.30 (1.09) | -0.15 ** (0.06) | 925 (1795) |
| (Number of Months After the Switch) ² | 0.11 * (0.05) | 0.01 (0.01) | 0.00 (0.00) | 4 (36) |
| Multiple Bank Relationships, Primary Lender, Scope of the Bank Relationship, and <i>Loan Type, Legal Structure, Credit Rating, Region, Economic Activity, Bank Identity, and Month/Year dummy variables are included</i> | Yes | Yes | Yes | Yes |

TABLE 7. 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 (*Applet*: 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 |

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