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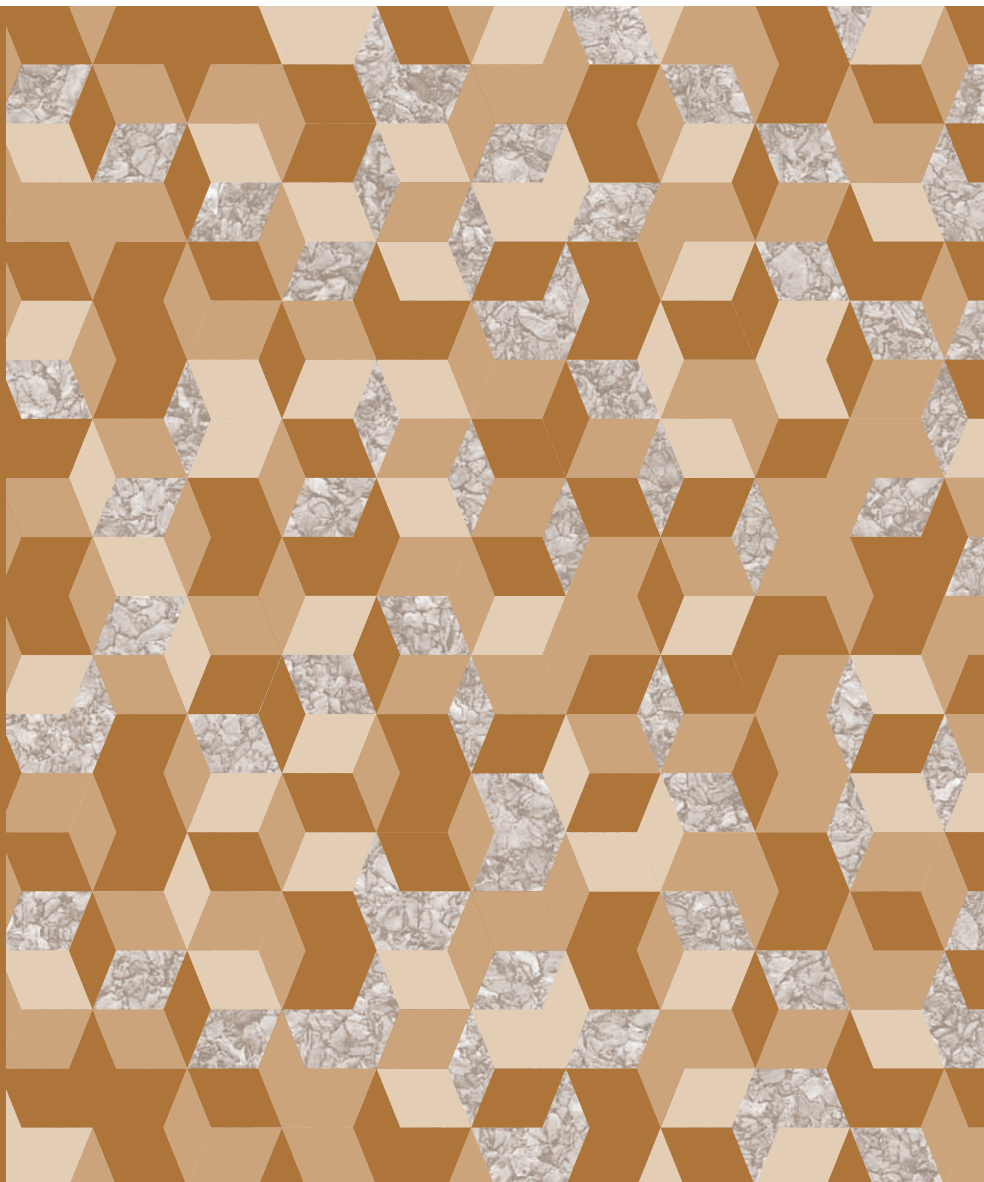

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# Sorry, We're Closed: Loan Conditions When Bank Branches Close and Firms Transfer to Another Bank

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**Abstract**
We study loan conditions when bank branches close and firms subsequently transfer to a branch of another bank in the vicinity. Such transfer loans allow us for the first time to observe the conditions granted when banks pool-price new applicants. Consistent with recent theoretical work on hold up in bank-firm relationships we find that transfer loans do not receive the discount in loan rates that prevails when firms otherwise switch banks. We hereby critically augment recent empirical evidence on dynamic cycles in loan rates.

JEL: G21, L11, L14

Keywords: competition, banking sector, market structure.

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## 1. Introduction

A recent paper by Ioannidou and Ongena (2010) in the Journal of Finance provides empirical evidence on contract conditions just before and after a firm switches to a new bank. Such an analysis of loan conditions is a first essential step in assessing the role that switching costs rooted in informational asymmetries play in credit markets. Our paper makes the second vital step. Indeed, missing from their empirical analysis was an assessment of the loan conditions that prevail when the inside lenders have no informational advantage – in the "first period" in theoretical frameworks that explain the formation of bank-firm relationships - and have to resort to pool-pricing applicants. This assessment is essential because the loan rate cycle Ioannidou and Ongena (2010) document – i.e., loans granted by new (outside) banks carry loan rates that are significantly lower than the rates on comparable new loans from the firms' current (inside) banks - in principle could also be explained by fixed shoe-leather switching costs a la Klemperer (1987) for example (Degryse *et al.* (2009)).

In this paper we complete their analysis by studying loan conditions when banks deal with many new credit applicants at once, situations that may occur when branches of other banks in the vicinity are closed. We thereby provide further essential evidence on the exact source of the estimated switching costs.

Our analysis merges records from three large and unique databases maintained by the Banco de Portugal (BoP), i.e., the public credit registry, the database of new credit operations, and a dynamic list of all bank branches. These three databases allow us to distinguish between "regular switches", i.e., one firm starts dealing with a new bank, and "transfers", i.e., after the closure of the branch of a bank that has otherwise no branches in the vicinity many firms start dealing with a new bank. We compare the loan conditions obtained by a switching and transferring firm with the terms on loans obtained by a large group of similar nonswitching firms. Given the large number of loans in the database, and following Ioannidou and Ongena (2010), we analyze only new loans, thereby ensuring at once the timeliness of the information or loan terms and comparability with their findings, and we match on month of loan origination and on bank, firm, and contract characteristics to account for macroeconomic conditions and for differences across lenders, borrowers, and contracts. Using an exact matching procedure allows us to get closer to the needed counterfactuals, i.e., the loan rates offered by the inside or outside banks to the switchers and transferrers. We first confirm the pattern of bank loan conditions documented in Ioannidou and Ongena (2010). Our findings show that a new loan granted by an outside bank – one that was not engaged by the firm for at least one year and consequently has no recent information about the firm – carries a loan rate that is 89 basis points lower than the rates on comparable new loans from the firm's current inside banks, and 59 basis points lower than the rates on comparable new loans that the outside bank currently extends to its existing customers. In contrast, when following a branch closure

many firms transfer from the closing branch to a another branch of a new bank there is no discount, i.e., the loan rate offered to these new customers is similar to the loan rate they may have received before. But this effect is present only for their first transfer and not for subsequent switching which again occurs at a discount. Other loan conditions follow a similar pattern. Overall, our evidence is consistent with the hypothesis that after a branch closure the informational link between the inside bank and its firms is broken. As a consequence, the outside bank that grants the first (transfer) loan to the firm will simply pool-price and lend to the firm at a market interest rate reflecting the pooled risks. The pattern we observe is not consistent with shoe-leather switching cost as under competitive conditions those lead to discounts also for transfer loans. Our findings thereby corroborate key elements in theoretical models on bank-firm relationships. We document that switching by individual firms involves lower loan rates but that transferring by many firms concurrently does not. This pattern is therefore likely due to informational asymmetries, as in Sharpe (1990), Rajan (1992), and von Thadden (2004). The rest of the paper proceeds as follows. Section I introduces the testable hypotheses and underlying assumptions of banking theory on hold-up problems, and then summarizes the extant empirical literature and shows how our unique data set allows us to improve the test design. Section II describes the data and provides descriptive statistics. Section III tests our hypotheses and provides robustness checks. Section IV concludes.

## 2. Hypotheses and Related Literautre

### *2.1. Hypotheses and Assumptions*

Access to private information about a borrower by an incumbent bank creates hold-up [1]. According to Sharpe (1990), inside banks extract rents from firms because they can holdup companies from establishing relationships with outside banks. Inside banks have an informational advantage over outside banks. When a firm is high quality, outside banks cannot observe it. The inside bank offers a somewhat lower interest rate and the high quality firm has no incentive to switch. In the model proposed by von Thadden (2004) outside banks will optimally randomize loan rates to attract firms that have the same observed characteristics but in the end at best break even in terms of profits. From his model, three hypotheses are empirically verifiable:

1. Holdup costs are also present in Rajan (1992), Hauswald and Marquez (2003), Hauswald and Marquez (2006), Egli *et al.* (2006), Black (2006) and Karapetyan and Stacescu (2014), among others. See also the discussion in Ioannidou and Ongena (2010).

(H1) Firms switch banks from one period to the other.
(H2) Switching loans have lower interest rates than nonswitching loans if the inside bank has private information about the firm.
(H3) If the inside bank is deemed not to have private information about a specific firm, in case its branch closes for example and all its firms have to leave irrespective, outside banks will pool the arriving firms. In this case the resultant "transfer loans" will not have lower interest rates compared to nonswitching loans.

### *2.2. Empirical findings in the literature*

A number of papers explore the impact of relationship duration on loan rates and other contract terms (Boot (2000), Berger and DeYoung (2002), Degryse and Ongena (2008) and Degryse *et al.* (2009) review this literature). The evidence in this literature was mixed. In contrast to this literature, and following Ioannidou and Ongena (2010), we study firms and banks over a relevant period of time, identify switches and transfers, and study the loan conditions associated with switching and transferring by comparing the loan conditions on switching and transfer loans to the conditions on similar nonswitching loans. To identify similar loans, we match on the month of loan origination and on bank, firm, and contract characteristics[2]. Our paper also contributes to a literature that studies the effects of bank distress and/or mergers - and subsequent local branch reconfigurations and closures - on local development and crime (Garmaise and Moskowitz (2005)) and in general on borrowers' access to credit and switching behavior (Sapienza (2002), Degryse *et al.* (2011)) and welfare (Slovin *et al.* (1993), Karceski *et al.* (2005)) [3]. Complementing this literature we study the bank loan conditions obtained by switchers and transferrers.

2. We note, following Ioannidou and Ongena (2010), that most studies assume that the collateral and maturity decisions are taken either independently or sequentially after the loan-granting decision but before the determination of the loan rate. Ignoring the joint character of the loan decision may bias the findings (Berger *et al.* (2005), Brick and Palia (2007), and Ortiz-Molina and Penas (2008)). 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), Berg (2015)) and the pricing implications of cross-selling (Liberti (2004)). By matching on bank, time, type of loan, and loan characteristics, we control for loan fees and cross-selling (assuming banks at the same point in time apply the same fees and cross-selling practices to similar loans and borrowers with similar relationship characteristics). Matching is nonparametric and does not incorporate information from outside the overlap region between the treatment and control groups.

3. Related papers study the impact of relationship, firm, bank, and market characteristics on the probability of a firm staying with or switching from/to a bank (e.g., Ongena and Smith (2001), Farinha and Santos (2002), and Gopalan *et al.* (2007)).

## 3. Data and Descriptive Statistics

Our analysis merges records from three large and unique databases. First, we have access to all the data from the Portuguese public credit registry, the *Central de Reponsabilidades de Crédito (CRC)*, which is managed by the Banco de Portugal (BoP). The BoP requires all banks to report total loan exposures of non-financial companies (henceforth "firms"). Accessing this unique database - one of the most comprehensive in the world (Miller (2003)) - we have monthly corporate loans for all resident banks between January 1987 and July 2015. This data allows us to retrieve loan monthly exposures for every firm-bank pair, including information on loan type and status (e.g., short or long term, in default, on or off-balance sheet exposure).

We also employ the Portuguese database of new credit operations, the *Informação Individual de Taxas de Juro*, which is also managed by the BoP. The BoP requires Portuguese banks to report the interest rate of new loans given to firms. From June 2012 to December 2014, banks with an annual volume of new loans to firms greater than EUR 50 million had to report the interest rates of new loans and this obligation was extended to all resident banks in January 2015 [4]. For each loan, there is information about the date of origination, interest rate, maturity, maturity of interest rate, and loan amount [5]. For each borrowing firm, we have information about their industry, post code, and total bank debt.

Finally, the paper relies on the list of bank branches maintained by the BoP, i.e., the *Registo Especial de Instituições* (REI). For each branch, REI provides the opening day, closing day, and postal code. This database can be matched with loan data because banks are identified with the same codes in every dataset. We also geographically map the postal codes of bank branches and firms to calculate the physical distance between them.

Because the available information for banks is limited to the previous two months, information asymmetries remain[6]. For example, if a firm pays back an overdue loan, the record resets without any trace of overdue payments on the credit history (Campion (2001)).

Apart from the information shared through the registry and the information gathered through a relationship, banks have few other sources of information

4. As indicated later we re-run all main specifications reported later using only the period until December 2014 but results are virtually unaffected.

5. Given all this information and a zero minimum loan size the combined database is consequently as comprehensive as the credit registers of Bolivia (e.g., Ioannidou and Ongena (2010), Berger *et al.* (2011), or Ioannidou *et al.* (2015)), or Spain (e.g., Jiménez *et al.* (2006), Jiménez *et al.* (2012)).

6. Limiting "the amount of data made available for distribution to the financial institutions to the current month" is common in many countries including Portugal (see Miller (2003), Table 1A.7, Column 3). Administrative costs and regulatory objectives may explain the short information-sharing window. A two-month window seems too short to achieve optimal memory loss a la Vercammen (1995).

for their credit evaluations in Portugal. Most firms are micro or small firms and do not have audited financial statements. As a result, the capital markets are not well developed and the banking sector is the principal source of capital for most firms. Since credit derivatives are not widely available, firms seeking to adjust interest payments have to renegotiate or switch.

The analysis focuses on loans to private non-financial firms, in particular, on new loan initiations by all commercial banks between 2012:06 and 2015:05[7]. We exclude overdrafts and current account credits to avoid distortions in the analysis of loan interest rates. All loans are granted by one lender (i.e., are never syndicated). Analyzing only new loans allows us to employ up-to-date and comparable firm and contract information at the precise time that firms "switch" (or "transfer") to a new bank. The total exposure of Portuguese banks to private non-financial firms was approximately 60 percent of GDP in June 2012 - the beginning of the sample period. The 6 largest banks held 85 percent of the market. At the regional level, the Herfindahl-Hirschman Index (HHI) varies between 1,432 and 1,568. For new loans, the HHI varies between 1,633 and 2,785 in 2015. In the same manner, more remote regions have high concentration indices, with the HHI in the province of Bragança varying between 3,458 and 6,737 in the same period for example. There are 1,363,121 new loans to 94,281 firms in the sample. 90 percent of these firms are limited companies (Sociedades por Quotas) and 9 percent are corporations (Sociedades Anónimas). Corporations are much larger than limited companies, which coincides with the findings of Petersen and Rajan (1994) for example for US firms. In June 2012 the average (median) corporation has €6,041,384 (€1,639,503) in debt outstanding, while the average (median) limited company has only €435,456 (€122,714) in debt outstanding. In the sample period 32 percent of all firms are in the retail industry, 17 percent in manufacturing and 11 percent in construction.

86 percent of all new loans are given to firms that have more than one relationship. However, from all firms with some bank credit exposure in the beginning of the sample, only 36 percent have multiple relationships, suggesting that firms with multiple relationships get new loans much more often. The incidence of collateral is 38 percent, between the 24 percent reported by Ioannidou and Ongena (2010) and the 53 percent reported by Berger (1995)[8].

7. To keep the set of financial institutions homogeneous in terms of financial structure and regulation, we focus on loans from commercial banks and exclude loans from other formal nonbank institutions (such as private financial funds, credit unions, mutual societies, etc.). Most commercial banks are privately owned. Banks are also prohibited from owning nonfinancial firms (Barth *et al.* (2006)). The sample period is characterized by an economic recession. The average growth rate of real GDP is -0.8 percent, somewhat lower than the average -0.03 percent growth rate of the previous five years.

8. Hence the incidence of collateral is fairly low and even (fully) collateralized loans may still carry a positive loss in the event of default – a prerequisite for von Thadden (2004) to be applicable.

There were 839 branch closures during the sample period. 82 percent of all branch closures are associated with 6 banks, which had 70 percent of all firm-bank relationships (in June 2012). In geographic terms, closures are concentrated in Lisbon and Porto. These two regions represent 25 and 18 percent of all bank relationships (in June 2012), and 27 and 19 percent of all closures, respectively[9]. The significant net decrease in the number of branches occurred against a backdrop of pressures for cost-cutting measures. However, these pressures were not homogenously felt across all banks. Some of the largest banks in Portugal were recapitalized with funds from the bailout package agreed with the IMF, the ECB and the European Commission in 2011. In exchange for these funds, banks had to submit restructuring plans with the aim of improving profitability and solvency. Given there was a widely-shared concern about over-branching in Portugal, this included the substantial reductions in both the number of branches and staff members as a prime cost-cutting measure[10]. As a consequence these expedited branch closures were likely to be somewhat indiscriminate, i.e., not always based on local branch quality of firms and their profitability, providing for a unencumbered set of quasi-natural experiments.

## 4. Results

We test the hypothesis that transfers do not enjoy the interest rate discount that ordinary switches do. First, we document that switches and transfers occur. Second, we analyze interest rates for switches and transfers. We also investigate whether loan rates after switching and transferring present distinct patterns. Finally, we run some robustness tests and compare other loans conditions, namely the rate of collateralization, maturities and loan amounts.

### *4.1. Switches and transfers*

*4.1.1. Definitions.* For comparability, we use the definition of switching loans from Ioannidou and Ongena (2010). There are two conditions for a new loan to be classified as a switching loan. First, this new loan should be obtained from a bank with which the firm did not have a relationship during the previous twelve months. This bank is called the outside bank. Second, the firm must have had at least one relationship in the previous 12 months with at least one other bank. This bank is the inside bank. All new loans that do not observe these two conditions are nonswitching loans. In effect, and as in Ioannidou

9. As indicated later, removing these two regions from our sample will not affect our main findings.

10. For further details, please see for example the Press Release on July 24, 2013, by the European Commission on "State aid: Commission finalises discussions on restructuring plans for Portuguese banks CGD, Banco BPI, BCP."

and Ongena (2010), we conservatively assume that key inside information can get stale as quickly as within one year. Transfer loans are a subgroup of the switching loans. A switching loan is a transfer loan if the nearest branch of any of the inside banks of the firm was closed in any of the considered periods prior to the concession of the new loan by the outside bank (we consider 1 to 6 months after closure, 7 to 12 months after, and more than 12 months after as periods). Two additional conditions have to be observed in transfer loans. First, the physical distance between the firm and the closing branch must be smaller than 5 kilometers (as the crow flies). Second, after the closure the closest branch from this inside bank must be more than 5 kilometers away from the firm [11]. These conditions ensure that there is a strong locational driver for the firms to approach a branch of another bank en masse. Figure .1 illustrates the definitions of nonswitching, switching and transfer loans, while figure .2 sketches the geographical set-up.

[Figures .1 and .2 around here]

The 12 month window was chosen to match the definition of Ioannidou and Ongena (2010)[12]. In the same manner, we assume that lending relationships comprise all sorts of used and unused credit, including credit contracts in which the firm shares the responsibility of repayment with other institutions. Our definition of switching does also not differentiate between those firms that "move" between banks and those firms that "add" a bank relationship[13].

11. As in other countries (e.g., Petersen and Rajan (2002), Degryse and Ongena (2005), Agarwal and Hauswald (2010)) most firms in Portugal engage banks in the vicinity. 78 percent of the firms employ at least one bank that has branches in the same postal zone as the firm while 63 percent firms engage only banks that have a branch there. For radii of 10 kilometers estimates are qualitatively similar but based on seemingly more noisy information.

12. Empirical findings suggest that a substantial portion of the bank's inside information is collected during the first year (Cole (1998)). Ioannidou and Ongena (2010) show that their main results are robust to using 24- and 36-month cut-offs. As our estimates for the switching spread are most similar to theirs, we consider the 12-month as appropriate.

13. We concur with Ioannidou and Ongena (2010) that differentiating between "adders" and "movers" based on whether they have or do not have other outstanding loans at the time of the switch does not necessarily provide a meaningful distinction. Adders could be classified as movers if, at the time of the switch, their inside loans expired and were not renewed until after they got a loan from an outside bank. Similarly, movers could be classified as adders if their inside loans happened to expire a few months after the switch. It is therefore hard to develop a meaningful classification without relying on future (but possibly endogenous) information. That is, firms may decide to reverse their initial decisions, depending on future offers they receive from both the inside and outside banks. We also believe that investigating the conditions under which a firm obtains a loan from another bank (and not from an existing lender that remains operational or closes its branch) is the most pertinent question - and it is the one addressed in von Thadden (2004). It is correct that moving versus adding a relationship may be a meaningful distinction for de novo firms (Farinha and Santos (2002)) or for firms that switch following bank mergers (Degryse *et al.* (2011)). As we analyze only

Moreover, we do not retain firms that cease their relationship with the inside bank (i.e., firms that do not have any business dealings with this bank for more than 12 months), because this question is not relevant in the context of the model presented by von Thadden (2004) that we are testing empirically.

### *4.2. Statistics*

*4.2.1. Firms and Switching Loans.* There are 24,292 switches in the sample representing 1.8 percent of all new loans in the period. From the 94,281 firms that obtained at least one new loan, 16,568 switched at least once, representing 17.6 percent of our sample, or 5.9 percent per year. Results are similar to the previous literature about bank switching, which is summarized by Degryse *et al.* (2009). Farinha and Santos (2002) for example also find that 64 percent of 1,577 Portuguese de novo firms in their sample switch between 1980 and 1996, i.e., approximately 3.7 percent of their sample switches in a year. Nevertheless, this calculation underestimates the annual percentage of switches in their sample because not all relationships last from 1980 to 1996. 87 percent of all switching firms in the sample are limited companies while 12 percent are corporations. Average (median) bank debt for switching firms is €532,032 (€68,424), less than €579,224 (€35,661) observed for nonswitching loans. The difference is not statistically significant at the 10 percent level. However, larger firms obtain new loans more often. These findings contrast with the results from Ioannidou and Ongena (2010), who find that the bank debt of switching firms is the triple of nonswitching firms. Moreover, we also find that 62 percent of all switching loans are associated with firms with multiple relationships, less than the 87 percent reported for nonswitching loans. 35 percent of all switches occurred in the retail sector, followed by 25 percent in manufacturing and 8 percent in construction. 79 percent of all switching firms only switched once, 13 percent switched twice, and 8 percent more than twice. Table .1 provides descriptive statistics for all (individual) switching and nonswitching loans (the statistics provided in the previous sections were by firm). Loan rates are on average 146 basis points lower for switching loans, not accounting for differences in other loan and firm characteristics. The default rate on the pool of switching firms is 0.7 percent, well below the 3.4 percent verified for nonswitching firms. This is consistent with the fact that banks can observe in the credit register whether the firm has overdue loans. It might also be a signal of the existence of evergreening practices, empirically documented by Peek and Rosengren (2005), as inside banks are clearly more likely to grant a loan to a firm in distress than

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firms that had an inside bank, de novo firms are unlikely to play an important role in our sample. While bank mergers do not affect results in the sample period, our analysis is indeed focused on differentiating between switching and transferring (following local branch closures).

outside banks.

[Table .1 around here]

80 percent of all switching loans are associated with limited companies and 16 percent with corporations, while 68 percent of all nonswitching loans are associated with limited companies and 31 percent with corporations. In the same manner, on average the total amount of bank debt associated with switching loans is €848,602, less than one third of the €3,563,670 for nonswitching loans. Such results are driven by the fact that large firms tend to get more than one (nonswitching) loan from the same bank. 66 percent of all switching loans are collateralized, while 38 percent of other loans are collateralized. However, the maturity of switching loans is on average longer than of non-switching loans (9 months vs. 7 months, respectively), so there is only mixed evidence that banks are using other loan characteristics to deal with the information asymmetries of new borrowers. Switching loans are also more likely to have a fixed interest rate and firms less likely to hold multiple relationships. The outside bank most often does not immediately become the primary lender of the switching firm, while many nonswitching loans are (almost by definition) regularly provided by the primary lender. Additionally, the relationship with the outside bank usually starts with only one credit product, while nonswitching loans are normally associated with multi-product relationships.

*4.2.2. Loan Transfers.* Table .2 provides descriptive statistics for transfers and nonswitching loans. There are 1,129 loan transfers, representing 0.08 percent of all nonswitching loans and 5 percent of all switching loans. The average interest rate for loan transfers is 5.36 percent, 219 basis points less than for nonswitching loans and 73 basis points less than for switching loans. Other loan characteristics seem to be similar to the ones verified for switching loans (see also Table .1), namely the percentage of defaulted loans, collateralization, maturity, loan amount, share of floating rate loans and of multiple relationships, the likelihood that the outside bank is the primary lender and the likelihood of multiple products in the bank relationship. 74 percent of all loan transfers were given to limited companies and 24 percent to corporations, in comparison to 80 percent and 16 percent for switching loans. In contrast, the average amount of bank debt is €1,051,500, more than the average for switching loans (€848,602).

[Table .2 around here]

Transfers are distributed among different sectors and geographies. Therefore, a straight comparison of simple averages is inadequate to arrive to conclusions. Manufacturing represents 39 percent of all transfers, followed by retail (34 percent) and the transport industries (6 percent). 19 percent of all transfers and 21 percent of all switches happen in Porto. However, while

for switches Porto is followed by Lisbon (18 percent), for transfers Lisbon only appears in the fourth place (11 percent). This happens due to the high branch density in Lisbon, being common to find several branches of the same bank within a 5 km radius.

### *4.3. Loan Rates*

*4.3.1. Matching.* The ideal setting to compare switching and transfer loans (to nonswitching loans) would be to know the interest rate offered to the firm for a nonswitching loan. However, we do not have this information for many loans, so we use a matching model to derive it (we return to using nonswitching loans granted to the same firm in robustness). As in Ioannidou and Ongena (2010) we first examine whether the loan rate that the switcher receives from the outside bank is lower than the rate its inside bank offered. Since the inside bank's unsuccessful offer is unobservable, we approximate it using similar loans that the inside bank granted in the same month to other comparable firms (Figure .3). Recognizing the possible impact of bank characteristics on the inside and outside offers, in a similar matching exercise we also compare the rates on the switching loans to the rates of similar loans that the switcher's outside bank granted in the same month to other comparable existing customers (Figure .4).

[Figures .3 and .4 around here]

Table .3 contains the list of variables we use to establish the matching model. We match loans on the quarter they were given, on firm characteristics (credit rating, region, and industry) and on loan characteristics (existence of collateral, maturity, loan amount, and floating loan rate). We also match either with other loans from the firm's inside banks or with loans from the firm's outside bank. For inside banks, we also match on the affiliation with an international banking group.

[Table .3 around here]

The impact of unobserved loan characteristics will be reflected in interest rate heterogeneity within the same matching group. Unobserved borrower heterogeneity works against finding evidence consistent with a lower interest rate granted to switchers. In von Thadden (2004), unobservable bad borrowers are more likely to switch. Hence, if our matching variables do not adequately capture borrower quality, then bad switchers are more likely to be paired with good (instead of bad) nonswitchers, resulting in smaller estimated cuts (see simulations of the von Thadden model in Ioannidou and Ongena (2010)). Notice that matching on both the quarter of loan origination and loan maturity also allows us to control for unobservable economic conditions that could affect the loan rates. We match all switching loans with non-switching loans that have the same characteristics and calculate the spread between the interest rates of these loans. We regress the spread on a constant and weight each observation

to the inverse of the number of matches for switching loan or transfer i. For instance, if transfer i has 6 matches, each match will have a weight of 1/6 in the regression.

### *4.4. Interest rate differential for switching and transfer loans*

*4.4.1. Switching loan rates.* Table .4 contains the list of matching variables used to compare the interest rate on the switching and (matched) nonswitching loans, the number of switching and nonswitching loans, the total number of observations used in each specification, and the average interest rate differential between switching and nonswitching loans. Standard errors are reported in parentheses and are clustered at firm level.

[Table .4 around here]

In Column I, we compare the interest rate of switching loans with the interest rate of non-switching loans made by firms' inside banks, conditional on the specified matching variables. In this regression we can employ 6,265 switching loans, which are paired with 31,560 nonswitching loans. The total number of matched pairs is 50,915, which means that on average each nonswitching loan is paired with 1.6 switching loans. Non-switching loans have interest rates that are on average lower by 122 basis points, which is estimated to be significant at the one percent level. This estimated discount is most similar, though in absolute magnitude somewhat larger, than the one reported in the literature. For instance, Ioannidou and Ongena (2010) - using the same matching methodology as we do - estimate the discount to equal 89 basis points in Bolivia, while Barone *et al.* (2011) report a switching discount of 44 basis points in Italian local banking markets.

The somewhat higher discount is likely related to heterogeneity in interest rate costs faced by Portuguese banks between 2012 and 2015. In this period financing rates varied among Portuguese banks because of the rising sovereign debt interest rates. Crosignani *et al.* (2015) for example find that the lending patterns of foreign, large and small local banks were heterogeneous in the period between 2005 and 2014. In Column II of Table IV we therefore also match on the bank affiliation to an international banking group (i.e., we match local to local and foreign to foreign banks). Adding this variable brings the interest rate differential to 89 basis points (which is exactly the same as in Ioannidou and Ongena (2010))[14].

In Column III, we report the interest rate differential when comparing with interest rates on loans granted by outside banks (recall Figure .4). Now the comparison is within the same bank during the same quarter. Therefore the loan rate differences between switching and nonswitching loans cannot be attributed

14. As in the tables, *, **, and *** indicate 10, 5, and 1 percent levels of significance, respectively.

simply to differences in the marginal cost of funding between inside and outside banks (or more generally to any other form of unobserved heterogeneity with respect to the two banks). This is an important advantage over the matching exercise in Column II (or an alternative exercise whereby even more bank characteristics are added to the set of matching variables). So for the rest of the paper we focus the analysis on comparing switching loan interest rates with rates from nonswitching loans of the outside bank to avoid the impact of heterogeneous interest rate policies among different types of banks. Column III is therefore our benchmark model. The interest rate discount now equals 58 basis points, and it is significant at the 1 percent significance level. This value is surely within the range of the ones reported previously in the literature. The discount represents 7.8 percent of the interest rate for nonswitching loans, which compares with 6.4 percent in Ioannidou and Ongena (2010) and 7 percent in Barone *et al.* (2011). And as noted in these papers such a discount for switching loans is in general consistent with theoretical predictions emanating from the framework in von Thadden (2004). The outside bank will only be able to poach firms to which it offers interest rates below what is currently offered to the firm. In Column IV of Table .4 in an important robustness exercise we can match on one extra variable, i.e., firm identity. This allows us to compare switching and non-switching loans granted to the same firm in a given quarter. In contrast to Ioannidou and Ongena (2010) we are able to match on firm identity because our starting sample of switching loans is almost 23 times as large in size as theirs (i.e., 24,292 versus 1,062 switching loans). Matching on firm identity does not alter our main findings, i.e., the interest rate discount now equals 92 *** basis points.

*4.4.2. Interest rates for transfer loans.* Having benchmarked our switching estimates with those in the extant literature, we now turn to our main investigation. Table V compares the interest rate of switching loans and nonswitching loans before and after the closest branch of the inside bank that was servicing the firm was closed. Transfer loans are all switching loans that occur after the branch is closed. Transfer loans are matched using all the variables of Column III in Table .5, i.e., they are matched with non-switching loans from the outside bank.

[Table .5 around here]

Before branch closure, we observe 230 switching loans, which are paired with 878 nonswitching loans. The total number of matched pairs is 1,050. Switching firms enjoy an average discount of 63 basis points, which is very close to the 59 basis points reported for the whole sample. The discount is again significant at 1 percent level. This implies that prior to closure those areas affected by branch closures and those that are not observe similar switching discounts. Column II in Table .5 contains transfer loans 1 to 6 months after the closest branch of the inside bank is closed. There are 68 transfer loans in this period,

which are matched with 295 nonswitching loans, forming 305 matched pairs. The coefficient is positive but not significant at the 10 percent level. In fact, in the first six months after the branch is closed firms no longer enjoy switching discounts, which is consistent with the prediction for the first period in the von Thadden (2004) model. This evidence is coherent with the hypothesis that after the branch closure the informational link between the inside bank and its firms is broken. As a consequence, the outside bank that grants the first (transfer) loan to the firm will simply pool-price and lend to the firm at a market interest rate reflecting pooled risks. In the period from 7 to 12 months after the branch closure, there are 78 loan transfers, which are matched with 338 loans, forming 535 matched pairs. The coefficient is negative and close to the initial level (-57 basis points), implying that as time passes the effect of the branch closure disappears. From the 13th month onwards the effect of the branch closure disappears completely. In this period there are 236 loan transfers, 986 non-switching loans, and 1,371 matched pairs. The switching discount is 94 basis points, statistically significant at the 1 percent level. The reason for this reappearance of the discount in later time periods is that firms start re-engaging banks and hence we are no longer dealing with first transfer loans.

*4.4.3. First versus later transfers.* Indeed, according to the model of von Thadden (2004), only the first transfer loan after the branch closure should not have the interest rate discount observed in switching loans. After the first transfer loan transfer, the firm establishes a relationship with a new bank. As a consequence, in future transfer loans the outside bank of the first transfer in effect becomes an new inside bank, therefore able to hold up the firm. Hence, the outside bank in subsequent transfer loans has to offer the switching rate that we observed before, otherwise the firm will continue to borrow from the inside bank. To test this conjecture, we separate first transfers from later transfers. Transfers are classified as "first transfers" if the firm is switching for the first time after the branch of its inside bank has closed and as "later transfers" otherwise. Table .6 shows interest rate differentials for first transfer loans only. The structure is similar to the one used in Table .4. Switching loans are matched with nonswitching loans from the outside bank. Matching variables are the ones used in Column III of Table .4. Before the branch closure, we use the same switching loans of Table .5, yielding the same switching discount of 63 basis points. We only keep first transfers that occur 1 to 6 months after the closure. There are 62 transfer loans, which are matched with 283 non-switching loans, forming 289 matched pairs. The coefficient is positive and results are not significant at the 10 percent significance level, meaning that there is no evidence of a switching discount up to 6 months after the closure of the branch.

[Table .6 around here]

Considering only first transfers, 7 to 12 months after the closure, we have 39 switching loans, 185 non-switching loans and 235 matched pairs. The coefficient is now positive, very close to 0, and non-significant at the 10 percent significance level. In Table .5 the coefficient was negative and significant, which implies that later transfers were driving this result. As a consequence, the evidence is consistent with the fact that the effect of the branch closure goes beyond 6 months. More than 12 months after the closure there are 155 first transfers, 659 non-switching loans, and 783 matched pairs. The coefficient is -97 basis points, close to the -94 basis points reported in Table .5. Results are significant at the 1 percent level. These results imply that in the long-term the effect of the branch closure fades even for first transfer loans. The evidence is consistent with the gradual fading of pool-pricing of the group of firms transferring in immediate need of financing, to a reestablishment of a discount granted to individual "switching" firms to be recovered later through informational holdup. Table .7 contains interest rate differentials for later loan transfers. This table again follows the same structure as in Table V. Before the branch closure we consider all switching loans and have an interest rate differential of -63 basis points (the same as reported in Tables .4 and .5). 1 to 6 months after the branch closure, there are only 6 switching loans classified as later transfers. These loans match up with 16 non-switching loans forming 16 matched pairs. On average, the interest differential is -82 basis points, but not statistically significant, suggesting that these loans do not enjoy any switching discount.

[Table .7 around here]

There are 39 other transfers between 7 and 12 months after the branch closure. These loans match up with 189 non-switching loans forming 300 matched pairs. The interest rate differential is -115 basis points and significant at the 5 percent level. Beyond 12 months after the branch closure, we observe 81 other transfers, 336 non-switching loans and 588 matched pairs. The switching discount is 89 basis points, significant at the 1 percent level. The value is close to the discount of 97 basis points observed for first transfers in Table .4. These results contrast with the findings from Table .6. While for first transfers there is no switching discount in the first year after branch closure, for later transfers we observe a sizeable discount. This result is consistent with the hypothesis that the outside bank receiving the transferring firm informationally captures it such that later transfers involving new outside banks will again result in the switching discount we have seen so far.

*4.4.4. Robustness.* In Tables .8 and .9 we return to the limited set of first and later transfer loans for which we also observe concurrent nonswitching loans being granted to the same firm, i.e., the matching scheme in Column IV in Table .4. While also matching on firm identity provides a high degree of confidence in having controlled for all relevant heterogeneity, few observations remain. For example we observe only 14 first transfer loans in the period 1 to

6 months after the branch closure that can be matched with 28 nonswitching. But despite this substantial drop in the number of observations results remain qualitatively most similar.

[Tables .8 and .9 around here]

In Table .10, we compare directly the difference between interest rate discounts of switching loans and of loan transfers. We match up switching loans with non-switching loans that share the characteristics of column III of Table .4 and calculate the interest rate difference between each switching loan and their matching non-switching loans. We regress interest rate differentials on a constant and on a categorical variable that classifies loan transfers according to the number of months since the closure of the branch of the inside bank. Switching loans that are not loan transfers have an average discount of 63 basis points, significantly different from 0 at the most common significance levels. In comparison to other switching loans, loan transfers up to 6 months after the branch closure have average interest rates greater than the switching interest rate by 78 basis points. This result is statistically significant at the 1% level, which confirms that loan transfers immediately after branch closures have interest rates that are significantly higher than the rates of normal switching loans. For later transfers, we do not observe this effect, as coefficients are not significant at the 10% significance level.

[Table .10 around here]

In Appendices 1 and 2 we also revisit two earlier mentioned issues, pertaining to the sample period and geographical area covered by our study. In Appendix A we replicate Tables .4 to .7 (for easy comparability we maintain the same table numbering) excluding the period starting in December 2014 after which all banks had to report loan rates. In Appendix B we exclude Lisbon and Porto, large cities where many closures occurred yet distances may play a different role than elsewhere due to branch density. In both cases our findings are most similar. Finally, in further unreported regressions we re-run all exercises only for closures of branches by banks that were recapitalized with bailout funds (as these closures could even be more externally imposed and therefore even less encumbered than other closures). Results are most similar[15].

15. While the pool-pricing of transfer loans should in principle be unaffected by the organizational characteristics of the closing branch, the pricing of switching loans can be affected by the organization of the inside bank. Loan officers at decentralized banks for example may be more incentivized to collect and use soft information (Stein (2002)) that may be more private in nature than the hard information employed to price loans in centralized banks. The discount received when switching from a decentralized bank will then be steeper.

### *4.5. Other loan conditions*

*4.5.1. Switching loans.* Table .11 compares loan conditions of switching loans with loan conditions of comparable non-switching loans using the same matching technology used in Table .3. Recall that with this matching exercise, we aim to simulate the offered loan conditions as if the firm had not switched to the new outside bank and compare them with the switching conditions offered by this bank.

[Table .11 around here]

In Column I we report again the baseline results for the loan rate, already reported in Column III of Table .4. The interest rate differential is -59 basis points. In Column II we repeat the matching exercise for the likelihood that switching loans are collateralized. We also use the loan interest rate as a matching variable in this exercise to control for cases in which different collateral policies are related to the loan interest rate. There are 5,997 switching loans and 19,197 non-switching loans, forming 26,532 matched pairs. There is no statistically significant difference in collateralization between switching and non-switching loans at the 10 percent level. In contrast Ioannidou and Ongena (2010) find that switching loans are more likely to be collateralized than comparable nonswitching loans. The literature points out that banks are more likely to require collateral to reduce the impact of asymmetries of information (see Berger (1995)). However, under the von Thadden (2004) framework banks have incentives to offer better loan conditions to make firms switch. In Column III we run the matching model and compare differentials in maturity for loans with the same characteristics. Matching retrieves 8,361 switching loans, 33,275 nonswitching loans and 51,443 matched pairs. The maturity of switching loans is on average 0.63 months longer, and the difference is significant at the 1 percent level. The results are consistent with the hypothesis of von Thadden (2004) that banks have the incentive to offer better loan conditions to switching firms. The results are also consistent with the findings of Ioannidou and Ongena (2010), who arrive to a larger positive differential of 6.43 months. In Column IV, we resort to the matching model to calculate loan amount differentials between switching loans and matched nonswitching loans. We get 10,321 switching loans, 68,297 nonswitching loans and 122,053 matched pairs. While on average the loan amount for switching loans is greater by €1,262, the difference is not statistically significant at the 10 percent level.

*4.5.2. Loan transfers.* In Table .12, we repeat the matching model of Table XI for transfer loans. Panel A contains all transfer loans, while Panel B contains first transfers, and Panel C later transfers. In Panel A none of the loan conditions are statistically different at the 5 percent level. Transfers are less likely to be collateralized by 8 percentage points, but this result is only statistically significant at the 10 percent level. This evidence corroborates

previous findings. With the break of the informational link between the inside bank and the firm, the outside bank is able to lend without having to offer more beneficial loan conditions. Results are more evident at Panel B because we are only including first transfers. None of the loan conditions are statistically different at the 10 percent level, indicating that loan transfers and non-switching loans share on average the same loan conditions.

[Table .12 around here]

In Panel C, the interest rate of later transfers is lower on average by 111 basis points in comparison with non-switching loans. For loan amounts, there are 64 switching loans, 560 non-switching loans, and 1,285 matched pairs. Loan amounts of later loan transfers are on average lower by €22,945. According to Degryse *et al.* (2009), relationship borrowers tend to have better access to finance and therefore obtain larger loans than other borrowers that are initiating their relationship with another bank. However, we only find this effect for later transfers and not for regular switching loans.

## 5. Conclusion

Using comprehensive data from Portuguese branch closures and new loans issued between 2012 and 2015 we study how inside information affects loan conditions. Consistent with previous findings in the literature we find that switching loans receive interest rates that are on average 58 basis points lower than nonswitching loans. However, the interest rate on loans firms at once obtain after the closure of the branch of their inside bank, i.e., when transferring to a branch of another bank in the vicinity, are not different from the interest rates on nonswitching loans. Later transfers – or loan transfers that are not the first after the branch closure – again enjoy statistically significant interest rate discounts. The contribution of our paper is therefore clear. We provide the first evidence of pool-pricing of loans to groups of transferring firms in a clean quasi-experimental setting in which branches are hurriedly closed as part of bank restructuring programs. We thereby exclude the possibility that the findings on loan rate discounting in the literature so far are due to fixed shoe leather switching cost à la Klemperer (1987) - which would always be present - but are instead due to the presence of inside information and holdup in bank credit provision. Our investigation thus further corroborate key elements in modern banking theory (Sharpe (1990), Rajan (1992), and von Thadden (2004), for example).

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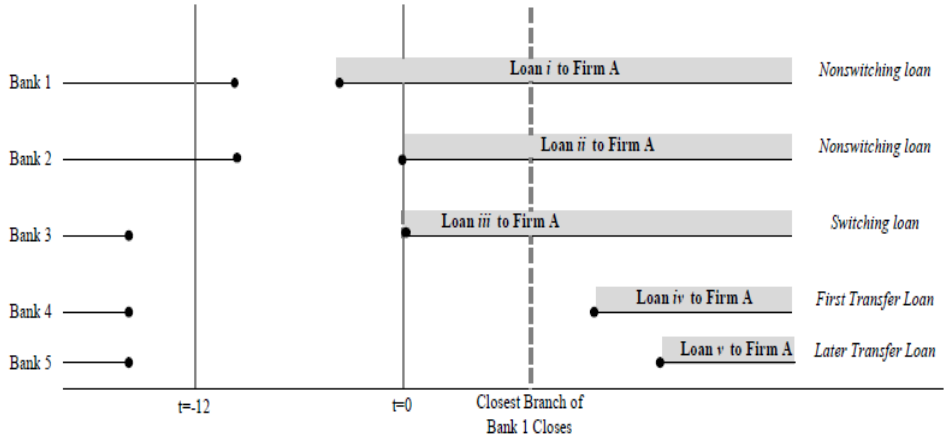


FIGURE .1: **Switching loans, transfers, inside banks and outside banks.** The figure represents the relationships between firm A and five different banks. Before t=0 firm A has a loan outstanding with Banks 1 and 2, the inside banks. At t=0 Firm A establishes a relationship with Bank 3. Bank 3 is an outside bank because the firm did not have a relationship with Bank 3 in the previous 12 months. Loans i and ii are nonswitching loans because these loans are granted by the inside banks. Loan iii is a switching loan because it is a new loan granted by an outside bank. Loan iv given by Bank 4 is a transfer loan because the loan is a switching loan and it was given after the branch of an inside bank (say Bank 1) was closed. Loan 4 is also a first transfer loan. A subsequent switching loan v obtained by Firm A from yet another Bank 5 is called a later transfer loan.

## Appendix A

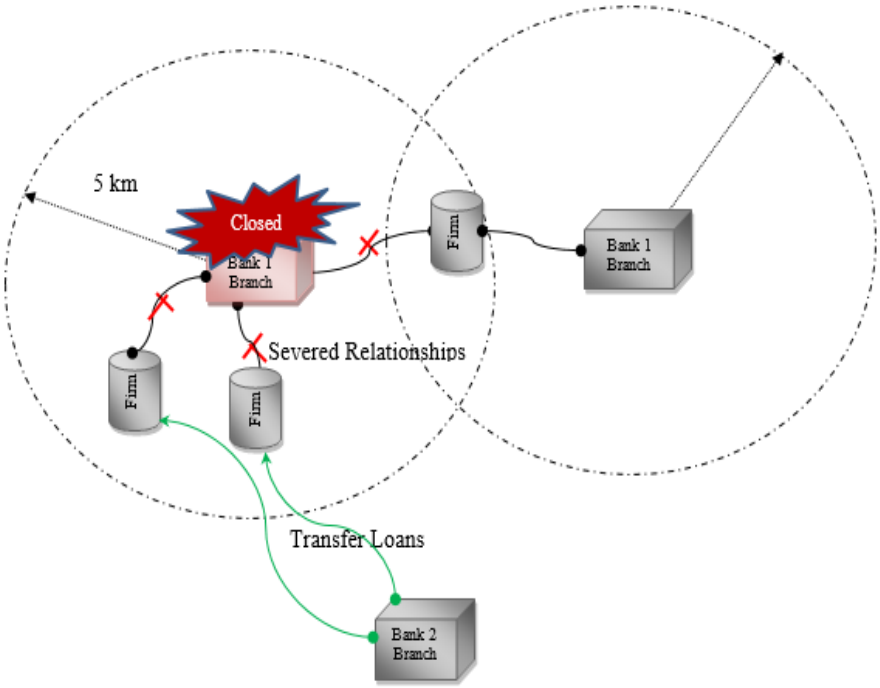


FIGURE .2: **Transfer loans given bank branch and firm location.** The figure displays the branch of Bank 1 that is being closed and the location of the other bank branches. Transfer loans are switching loans granted in the period after the bank branch closes by a branch of another bank to firms that are located within 5 kilometers of the closing branch (and that had a relationship with the bank of the closing branch) and that are located more than 5 kilometers from another branch of the bank that closes its branch.

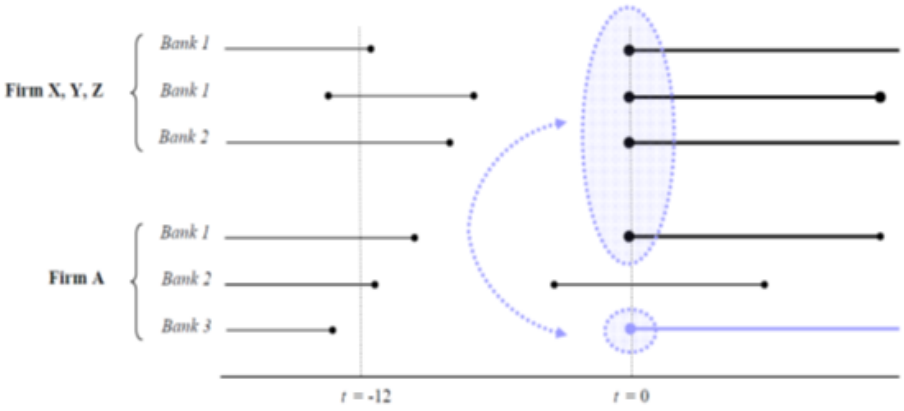


FIGURE .3: **Switching vs. nonswitching loans at the switcher's inside bank.** The figure displays the analysis in Table .4 (Columns I and II), where we compare the loan rate of the switching loan with comparable non-switching new loans from the switcher's inside banks at the time of the switch, as in Ioannidou and Ongena (2010). The loan granted by Bank 3 to Firm A is the switching loan; all other loans are nonswitching loans.

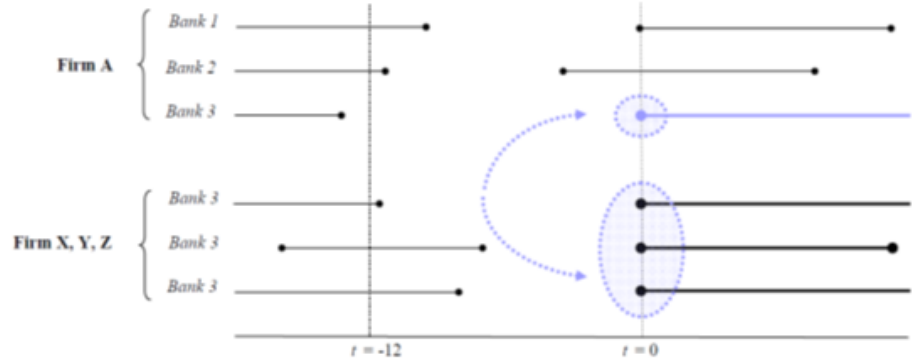


FIGURE .4: **Switching vs. nonswitching loans at the switcher's outside bank.** The figure displays the analysis in Table .4 (Column III) and subsequent tables, where we compare the loan rate of the switching loan with comparable non-switching new loans from the switcher's outside bank at the time of the switch, as in Ioannidou and Ongena (2010). The loan granted by Bank 3 to Firm A is the switching loan; all other loans are nonswitching loans.

| | Switching loans (n=24,292) | | | Nonswitching loans (n=1,338,829) | | |
|---|---|---|---|---|---|---|
| | Mean | St. Dev. | Median | Mean | St. Dev. | Median |
| Interest rate (in basis points) | 609*** | 268*** | 546*** | 755 | 368 | 643 |
| Risk indicator (100=default) | 3.39*** | 9.37*** | 2.01*** | 6.73 | 19.00 | 2.35 |
| Defaulted firm (in %) | 0.663*** | 8.11*** | 0*** | 3.37 | 18.00 | 0 |
| Limited company (in %) | 80.3*** | 39.8*** | 100*** | 67.60 | 46.80 | 100 |
| Public LLC (in %) | 16.1*** | 36.7*** | 0*** | 30.70 | 46.10 | 0 |
| Collateralized loan (in %) | 66.1*** | 47.3*** | 100*** | 37.90 | 48.50 | 0 |
| Loan maturity (months) | 28.5*** | 36*** | 6.13*** | 7.0 | 16.7 | 2.9 |
| Loan amount (in EUR) | 102,721*** | 596,717*** | 25,000*** | 57,347 | 960,996 | 9,000 |
| Amount of bank debt (in EUR) | 848,602*** | ,563,670*** | 89,486*** | 3,266,369 | 12,000,435 | 597,851 |
| Floating rate loan (in %) | 50.6*** | 50*** | 100*** | 81.30 | 39.00 | 100 |
| Multiple relationships (in %) | 61.8*** | 48.6*** | 100*** | 86.80 | 33.90 | 100 |
| Primary lender (in %) | 35.4*** | 47.8*** | 0*** | 53.90 | 49.80 | 100 |
| Relationship with multiple products (in %) | 18.5*** | 38.8*** | 0*** | 84.30 | 36.40 | 100 |

TABLE .1. **Selected Characteristics of Switching Loans and Nonswitching Loans.** We report the mean, standard deviation, and median for selected loan and firm characteristics. The unit of observation in this table is the number (n) of loan initiations for switching and nonswitching loans, respectively. We assess the differences in means using the Student's t-test. We assess the differences in medians using the Wilcoxon–Mann–Whitney test for continuous variables and the Pearson's Chi-square test for categorical variables. We assess the differences in standard deviations using Levene's test. We indicate whether the differences between the corresponding mean and median values are significant at the 10%, 5%, and 1% levels using *, **, and ***, respectively.

| | Transfer Loans (n=1,129) | | | Nonswitching loans (n=1,338,829) | | |
|---|---|---|---|---|---|---|
| | Mean | St. Dev. | Median | Mean | St. Dev. | Median |
| Interest rate (in basis points) | 536*** | 233*** | 521*** | 755 | 368 | 643 |
| Risk indicator (100=default) | 2.86*** | 7.87*** | 1.9*** | 6.73 | 19.00 | 2.35 |
| Defaulted firm (in %) | 0.53*** | 7.27*** | 0*** | 3.37 | 18.00 | 0 |
| Limited company (in %) | 74*** | 43.9*** | 100*** | 67.60 | 46.80 | 100 |
| Public LLC (in %) | 23.6*** | 42.5*** | 0*** | 30.70 | 46.10 | 0 |
| Collateralized loan (in %) | 59.9*** | 49*** | 100*** | 37.90 | 48.50 | 0 |
| Loan maturity (months) | 24.1*** | 34.5*** | 6.03*** | 7.0 | 16.7 | 2.9 |
| Loan amount (in EUR) | 107,924* | 393,434* | 25,000*** | 57,347 | 960,996 | 9,000 |
| Amount of bank debt (in EUR) | 1,051,500*** | 2,281,304*** | 312,336*** | 3,266,369 | 12,000,435 | 597,851 |
| Floating rate loan (in %) | 54.7*** | 49.8*** | 100*** | 81.30 | 39.00 | 100 |
| Multiple relationships (in %) | 86.40 | 34.3 | 100 | 86.80 | 33.90 | 100 |
| Primary lender (in %) | 22.9*** | 42.1*** | 0*** | 53.90 | 49.80 | 100 |
| Relationship with multiple products (in %) | 21.2*** | 40.9*** | 0*** | 84.30 | 36.40 | 100 |

TABLE .2. **Selected Characteristics of Transfer Loans and Nonswitching Loans** We report the mean, standard deviation, and median for selected loan and firm characteristics. The unit of observation in this table is the number (n) of loan initiations for transfer and nonswitching loans, respectively. We assess the differences in means using the Student's t-test. We assess the differences in medians using the Wilcoxon–Mann–Whitney test for continuous variables and the Pearson's Chi-square test for categorical variables. We assess the differences in standard deviations using Levene's test. We indicate whether the differences between the corresponding mean and median values are significant at the 10%, 5%, and 1% levels using *, **, and ***, respectively.

| Category | Matching variables | # | Possible values |
|---|---|---|---|
| Macro | Quarter | 13 | 2012q2 - 2015q2 |
| Bank | Inside bank | 2 | = 1 if the firm had a lending relationship with the bank in the last 12 months, and = 0 otherwise |
| Bank | Outside bank | 2 | = 1 if the firm did not have a lending relationship with the bank in the last 12 months, and = 0 otherwise |
| Bank | Foreign bank | 2 | =1 if bank is part of an international banking group, and = 0 otherwise |
| Firm | Firm | 94,281 | =1 per firm identity, and = 0 otherwise |
| Firm | Credit rating | 6 | = 1 if 1st z-score quartile, = 2 if 2nd z-score quartile, = 3 if 3rd z-score quartile, = 4 if 4th z-score quartile, = 5 if defaulting firm, = 6 if firm without z-score |
| Firm | Region | 20 | Aveiro, Beja, Braga, Bragança, Castelo Branco, Coimbra, Faro, Funchal, Guarda, Leiria, Lisboa, Ponta Delgada, Portalegre, Porto, Santarém, Setúbal, Viana do Castelo,Vila Real, Viseu, Évora |
| Firm | Industry | 13 | Agriculture, forestry and fishing, mining and quarrying, manufacturing, utilities, construction, wholesale retail and trade, transporting and storage, accomodation and food service activities, information and communication, real estate, finance and insurance, professional/scientific/technical activities, other services |
| Firm | Legal structure | 3 | Sociedade por Quotas, Sociedade Anónima, other legal structure |
| Loan | Collateral | 2 | =1 if loan is collateralized, and = 0 otherwise. |
| Loan | Loan maturity | 2 | = 1 if the matched loans have similar maturity (using a (−30%, +30%) window), and = 0 otherwise |
| Loan | Loan amount | 2 | = 1 if the matched loans have similar amount (using a (−30%, +30%) window), and = 0 otherwise |
| Loan | Floating loan rate | 2 | = 1 if the interest rate on the loan varies more than 50% of the time, and = 0 |

TABLE .3. **Matching variables.** We report the number of possible values (#) and a range (or list) of values for the matching variables

| | *Benchmark* | | | |
|---|---|---|---|---|
| Matching Variables | I | II | III | IV |
| Quarter | Yes | Yes | Yes | Yes |
| Inside bank | Yes | Yes | | |
| Outside bank | | | Yes | |
| Foreign bank | | Yes | | |
| Firm | | | | Yes |
| Credit rating | Yes | Yes | Yes | Yes |
| Region | Yes | Yes | Yes | Yes |
| Industry | Yes | Yes | Yes | Yes |
| Legal structure | Yes | Yes | Yes | Yes |
| Collateral | Yes | Yes | Yes | Yes |
| Loan maturity | Yes | Yes | Yes | Yes |
| Loan amount | Yes | Yes | Yes | Yes |
| Floating loan rate | Yes | Yes | Yes | Yes |
| Number of switching loans | 6,265 | 4,231 | 6,931 | 1,639 |
| Number of nonswitching loans | 31,560 | 20,531 | 23,892 | 3,382 |
| Number of observations (matched pairs) | 50,915 | 28,181 | 33,274 | 12,906 |
| Interest rate difference with matching | -122.37*** | -88.96*** | -58.53*** | -91.93*** |
| | (-7.87) | (7.00) | (4.60) | (12.37) |
| Interest rate difference without matching | -149.07*** | -107.83*** | -53.28*** | -64.67** |
| | (8.25) | (9.01) | (8.60) | (31.56) |

TABLE .4. **Spreads between Interest Rates on Switching Loans and Matched Nonswitching Loans Given by Inside or Outside Banks.** We assess the spread between the interest rate on switching loans and the interest rate on new nonswitching loans obtained (by other firms) from the switchers' set of inside banks in Column I and II and from the switchers' set of outside bank in Column III. In Column IV we compare the rate of switching loans with the rate of non-switching loans obtained by the same firm, excluding non-switching loans given by the outside bank. We match on the indicated variables. All variables are defined in Table III. We regress the spreads on a constant and report the coefficient on the constant. We weigh each observation by one over the total number of comparable nonswitching loans per switching loan. We cluster at the switching-firm level and report robust standard errors between parentheses. We also report the difference between the mean interest rate on the switching loans and the mean interest rate on the nonswitching loans in each column.We report standard errors between parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, two-tailed.

| | *Switching* | *Transfer* | | |
|---|---|---|---|---|
| Period since the branch closure | Before | 1-6 months after | 7-12 months after | >12 months after |
| Number of switching / transfer loans | 230 | 68 | 78 | 236 |
| Number of nonswitching loans | 878 | 295 | 338 | 986 |
| Number of observations (matched pairs) | 1,050 | 305 | 535 | 1,371 |
| Interest rate difference with matching | -62.81*** | 15.62 | -57.30* | -94.21*** |
| | (23.66) | (29.55) | (33.85) | (16.84) |
| Interest rate difference without matching | -79.73*** | -180.55*** | -209.16*** | -263.39*** |
| | (21.07) | (29.88) | (28.61) | (21.78) |

TABLE .5. **Spreads between Interest Rates on Switching or Transfer Loans and Matched Nonswitching Loans Given by the Outside Bank When the Closest Branch of the Inside Bank Closes.** We assess the spread between the interest rate on switching or transfer loans and the interest rate on new nonswitching loans obtained from the switchers' outside bank (by other firms) when the closest branch of the inside bank closes. We match on the variables indicated in Column III of Table IV. All variables are defined in Table III. We regress the spreads on a constant and report the coefficient on the constant. We weigh each observation by one over the total number of comparable nonswitching loans per switching or transfer loan. We cluster at the switching-firm level and report robust standard errors between parentheses. We also report the difference between the mean interest rate on the switching or transfer loans and the mean interest rate on the nonswitching loans in each column. We report standard errors between parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, two-tailed.

| | *Switching* | *First Transfer* | | |
|---|---|---|---|---|
| Period since the branch closure | Before | 1-6 months after | 7-12 months after | >12 months after |
| Number of switching / first transfer loans | 230 | 62 | 39 | 155 |
| Number of nonswitching loans | 878 | 283 | 185 | 659 |
| Number of observations (matched pairs) | 1,050 | 289 | 235 | 783 |
| Interest rate difference with matching | -62.81*** | 25.06 | 0.77 | -96.89*** |
| | (23.66) | (31.13) | (25.38) | (22.18) |
| Interest rate difference without matching | -79.73*** | -163.60*** | -239.23*** | -229.91*** |
| | (21.07) | (30.83) | (31.35) | (26.63) |

TABLE .6. **Spreads between Interest Rates on Switching or Transfer Loans and Matched Nonswitching Loans Given by the Outside Bank When the Closest Branch of the Inside Bank Closes.** We assess the spread between the interest rate on switching or transfer loans and the interest rate on new nonswitching loans obtained from the switchers' outside bank (by other firms) when the closest branch of the inside bank closes. We match on the variables indicated in Column III of Table IV. All variables are defined in Table III. We regress the spreads on a constant and report the coefficient on the constant. We weigh each observation by one over the total number of comparable nonswitching loans per switching or transfer loan. We cluster at the switching-firm level and report robust standard errors between parentheses. We also report the difference between the mean interest rate on the switching or transfer loans and the mean interest rate on the nonswitching loans in each column. We report standard errors between parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, two-tailed.

| | *Switching* | *Later Transfer* | | |
|---|---|---|---|---|
| Period since the branch closure | Before | 1-6 months after | 7-12 months after | >12 months after |
| Number of switching loans | 230 | 6 | 39 | 81 |
| Number of nonswitching loans | 878 | 16 | 189 | 336 |
| Number of observations (matched pairs) | 1,050 | 16 | 300 | 588 |
| Interest rate difference with matching | -62.81*** | -81.96 | -115.38** | -89.09*** |
| | (23.66) | (74.82) | (51.13) | (24.20) |
| Interest rate difference without matching | -79.73*** | -355.67** | -179.09*** | -327.45*** |
| | (21.07) | (90.54) | (45.13) | (26.11) |

TABLE .7. **Spreads between Interest Rates on Switching or Later Transfer Loans and Matched Nonswitching Loans Given by the Outside Bank When the Closest Branch of the Inside Bank Closes.** We assess the spread between the interest rate on switching or later transfer loans and the interest rate on new nonswitching loans obtained from the switchers' outside bank (by other firms) when the closest branch of the inside bank closes. We match on the variables indicated in Column III of Table IV. All variables are defined in Table III. We regress the spreads on a constant and report the coefficient on the constant. We weigh each observation by one over the total number of comparable nonswitching loans per switching or later transfer loan. We cluster at the switching-firm level and report robust standard errors between parentheses. We also report the difference between the mean interest rate on the switching or later transfer loans and the mean interest rate on the nonswitching loans in each column. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, two-tailed.

| | *Switching* | *First Transfer* | | |
|---|---|---|---|---|
| Period since the branch closure | Before | 1-6 months after | 7-12 months after | >12 months after |
| Number of switching / first transfer loans | 68 | 14 | 10 | 36 |
| Number of nonswitching loans | 121 | 28 | 21 | 56 |
| Number of observations (matched pairs) | 220 | 34 | 67 | 75 |
| Interest rate difference with matching | -212.53*** | -62.24 | -161.24** | -146.62*** |
| | (73.70) | (52.18) | (30.89) | (40.32) |
| Interest rate difference without matching | -263.61*** | -131.02** | -243.62*** | -275.54*** |
| | (20.28) | (54.97) | (25.57) | (26.51) |

TABLE .8. **Spreads between Interest Rates on Switching or First Transfer Loans and Matched Nonswitching Loans Given the the Same Firm When the Closest Branch of the Inside Bank Closes.** We assess the spread between the interest rate on switching or first transfer loans and the interest rate on new nonswitching loans obtained by the same firm when the closest branch of the inside bank closes. We match on the variables indicated in Column IV of Table IV and exclude nonswitching loans from the outside bank. All variables are defined in Table III. We regress the spreads on a constant and report the coefficient on the constant. We weigh each observation by one over the total number of comparable nonswitching loans per switching or first transfer loan. We cluster at the switching-firm level and report robust standard errors between parentheses. We also report the difference between the mean interest rate on the switching or first transfer loans and the mean interest rate on the nonswitching loans in each column. We report standard errors between parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, two-tailed.

| | *Switching* | *Later Transfer* | | |
|---|---|---|---|---|
| Period since the branch closure | Before | 1-6 months after | 7-12 months after | >12 months after |
| Number of switching loans | 68 | 0 | 21 | 42 |
| Number of nonswitching loans | 121 | 0 | 37 | 66 |
| Number of observations (matched pairs) | 220 | 0 | 70 | 191 |
| Constant | -212.53*** | n.a. | -76.67** | -119.40** |
| | (73.70) | n.a. | (25.46) | (50.29) |
| Interest rate difference without matching | -226.78*** | n.a. | -247.51*** | -293.98*** |
| | (26.80) | n.a. | (37.20) | (69.66) |

TABLE .9. **Spreads between Interest Rates on Switching or Later Transfer Loans and Matched Nonswitching Loans Given to the Same Firm When the Closest Branch of the Inside Bank Closes.** We assess the spread between the interest rate on switching or later transfer loans and the interest rate on new nonswitching loans obtained by the same firm when the closest branch of the inside bank closes. We match on the variables indicated in Column IV of Table IV and exclude nonswitching loans from the outside bank. All variables are defined in Table III. We regress the spreads on a constant and report the coefficient on the constant. We weigh each observation by one over the total number of comparable nonswitching loans per switching or later transfer loan. We cluster at the switching-firm level and report robust standard errors between parentheses. We also report the difference between the mean interest rate on the switching or later transfer loans and the mean interest rate on the nonswitching loans in each column. We report standard errors between parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, two-tailed.

| Type of transfer | All transfers | First transfers | Later transfers |
|---|---|---|---|
| Number of switching / transfer loans | 612 | 486 | 356 |
| Number of nonswitching loans | 2,497 | 2,005 | 1,419 |
| Number of observations (matched pairs) | 3,261 | 2,357 | 1,954 |
| Switching discount | -62.81*** | -62.81*** | -62.81*** |
| | (23.62) | (23.63) | (23.66) |
| Tranfer 1-6 months after | 78.43** | 87.87** | -19.15 |
| | (37.68) | (38.91) | (72.48) |
| Tranfer 7-12 months after | 5.51 | 63.58* | -52.57 |
| | (40.92) | (34.19) | (54.79) |
| Tranfer >12 months after | -31.40 | -34.08 | -26.28 |
| | (28.99) | (32.37) | (33.65) |

TABLE .10. **Spreads between Interest Rates on Switching or Transfer Loans.** We assess the spread between the interest rate on switching or transfer loans and the interest rate on new nonswitching loans obtained from the switchers' outside bank (by other firms) when the closest branch of the inside bank closes. We match on the variables indicated in Column III of Table IV. All variables are defined in Table III. We create a categorical variable to classify loan transfers. Categories are: switching loans that occur before the branch closure; loan transfers 1 to 6 months after the closure; loan transfers 6 to 12 months after the closure; loan transfers more than 12 months after the closure. We regress the spreads on a constant and on the categorical variable, and report the coefficient on the constant. We weigh each observation by one over the total number of comparable nonswitching loans per switching or first transfer loan. We cluster at the switching-firm level and report robust standard errors between parentheses. We also report the difference between the mean interest rate on the switching or first transfer loans and the mean interest rate on the nonswitching loans in each column. We report standard errors between parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, two-tailed.

| | I<br>Rate | II<br>Collateralized loans | III<br>Maturity | IV<br>Loan amount |
|---|---|---|---|---|
| Quarter, bank, credit rating, region, industry, legal structure, floating loan rate | Yes | Yes | Yes | Yes |
| Loan rate | | Yes | Yes | Yes |
| Collateral | Yes | | Yes | Yes |
| Loan maturity | Yes | Yes | | Yes |
| Loan amount | Yes | Yes | Yes | |
| Number of switching loans | 6,931 | 5,997 | 8,361 | 10,321 |
| Number of nonswitching loans | 23,892 | 19,197 | 33,275 | 68,297 |
| Number of observations (matched pairs) | 33,274 | 26,532 | 51,443 | 122,053 |
| Difference in loan conditions (at time of the switching loan) | -58.53*** | -0.01 | 0.63*** | 1,621.66 |
| | (4.60) | (0.01) | (0.24) | (3,132.36) |

TABLE .11. **Differences in Loan Conditions on Switching Loans and Matched Loans Given by Outside Banks.** We assess the difference in each loan condition on a switching loan and the loan condition on new loans obtained (by other firms) from the switchers' outside bank. We match on the indicated variables (similar to the benchmark model in Column III of Table .4). The variables are defined in Table .3. We regress the difference in each loan condition on a constant and report the coefficient on the constant. We cluster at the switching-firm level and report robust standard errors between parentheses. The results for the loan rate are also in Table .4, Column III. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, two-tailed.

| | I<br>Rate | II<br>Collateralized loans | III<br>Maturity | IV<br>Loan amount |
|---|---|---|---|---|
| Panel A: The Difference in Loan Conditions on Transfer and New Nonswitching Loans Obtained (by Other Firms) from the Switchers' Outside Bank | | | | |
| Number of transfer loans | 146 | 125 | 158 | 207 |
| Number of nonswitching loans | 633 | 549 | 856 | 1,736 |
| Number of observations (matched pairs) | 840 | 786 | 1,306 | 2,903 |
| Difference in loan conditions (at time of the switching loan) | -23.34<br>(24.40) | -0.08*<br>(0.05) | -0.46<br>(1.52) | -12,365.28<br>(8,804.40) |
| Panel B: The Difference in Loan Conditions on First Transfer and New Nonswitching Loans Obtained (by Other Firms) from the Switchers' Outside Bank | | | | |
| Number of first transfer loans | 101 | 87 | 113 | 143 |
| Number of nonswitching loans | 468 | 403 | 652 | 1,325 |
| Number of observations (matched pairs) | 524 | 495 | 837 | 1,618 |
| Difference in loan conditions (at time of the switching loan) | 15.68<br>(21.44) | -0.09<br>(0.06) | -0.96<br>(2.10) | -7,630.12<br>(12,179.94) |
| Panel C: The Difference in Loan Conditions on Later Transfer and New Nonswitching Loans Obtained (by Other Firms) from the Switchers' Outside Bank | | | | |
| Number of later transfer loans | 45 | 38 | 45 | 64 |
| Number of nonswitching loans | 205 | 206 | 295 | 560 |
| Number of observations (matched pairs) | 316 | 291 | 469 | 1,285 |
| Difference in loan conditions (at time of the switching loan) | -110.92**<br>(45.39) | -0.06<br>(0.05) | 0.79<br>(1.06) | -22,945.40***<br>(7,820.51) |

TABLE .12. **Differences in Loan Conditions on Switching Loans and Matched Loans Given by Outside Banks.** In Panel A, we assess the difference in each loan condition on a transfer loans (i.e., switching loan after the closest branch of the inside bank closes) and the loan condition on new nonswitching loans obtained (by other firms) from the switchers' outside bank. In Panel B we repeat the analysis only for the first transfers after the branch closure. In Panel C we do the analysis for the remaining later transfers. We match on the indicated variables (similar to the benchmark model in Table .6). Loans for the three panels span between the 1st and 12th month after closure. The variables are defined in Table .2. We regress the difference in each loan condition on a constant and report the coefficient on the constant. We 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.

| | *Benchmark* | | | |
|---|---|---|---|---|
| Matching Variables | I | II | III | IV |
| Quarter | Yes | Yes | Yes | Yes |
| Inside bank | Yes | Yes | | |
| Outside bank | | | Yes | |
| Foreign bank | | Yes | | |
| Firm | | | | Yes |
| Credit rating | Yes | Yes | Yes | Yes |
| Region | Yes | Yes | Yes | Yes |
| Industry | Yes | Yes | Yes | Yes |
| Legal structure | Yes | Yes | Yes | Yes |
| Collateral | Yes | Yes | Yes | Yes |
| Loan maturity | Yes | Yes | Yes | Yes |
| Loan amount | Yes | Yes | Yes | Yes |
| Floating loan rate | Yes | Yes | Yes | Yes |
| Number of switching loans | 4,794 | 3,312 | 5,357 | 1,255 |
| Number of nonswitching loans | 24,979 | 16,675 | 19,107 | 2,668 |
| Number of observations (matched pairs) | 40,693 | 23,051 | 26,940 | 6,267 |
| Interest rate difference with matching | -124.24*** | -89.35*** | -60.59*** | -87.90*** |
| | (9.78) | (8.37) | (5.35) | (14.59) |
| Interest rate difference without matching | -124.24*** | -111.15*** | -57.46*** | -59.36 |
| | (7.67) | (10.58) | (9.88) | (38.44) |

TABLE A.1. **Spreads between Interest Rates on Switching Loans and Matched Nonswitching Loans Given by Inside or Outside Banks Excluding Loans Given In or After December 2014.** We assess the spread between the interest rate on switching loans and the interest rate on new nonswitching loans obtained (by other firms) from the switchers' set of inside banks in Column I and II and from the switchers' set of outside bank in Column III. In Column IV we compare the rate of switching loans with the rate of non-switching loans obtained by the same firm, excluding non-switching loans given by the outside bank. We match on the indicated variables. All variables are defined in Table III. We regress the spreads on a constant and report the coefficient on the constant. We weigh each observation by one over the total number of comparable nonswitching loans per switching loan. We cluster at the switching-firm level and report robust standard errors between parentheses. We also report the difference between the mean interest rate on the switching loans and the mean interest rate on the nonswitching loans in each column. We report standard errors between parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, two-tailed.

| | *Switching* | *Transfer* | | |
|---|---|---|---|---|
| Period since the branch closure | Before | 1-6 months after | 7-12 months after | >12 months after |
| Number of switching / transfer loans | 208 | 36 | 47 | 158 |
| Number of nonswitching loans | 800 | 202 | 179 | 673 |
| Number of observations (matched pairs) | 964 | 209 | 266 | 960 |
| Interest rate difference with matching | -75.22*** | 11.79 | -56.12 | -107.57*** |
| | (23.74) | (46.07) | (56.05) | (21.43) |
| Interest rate difference without matching | -126.08*** | -120.28*** | -140.31 | -138.17 |
| | (23.88) | (42.83) | (95.43) | (111.40) |

TABLE A.2. **Spreads between Interest Rates on Switching or Transfer Loans and Matched Nonswitching Loans Given by the Outside Bank When the Closest Branch of the Inside Bank Closes Before December 2014.** We assess the spread between the interest rate on switching loans and the interest rate on new nonswitching loans obtained (by other firms) from the switchers' set of inside banks in Column I and II and from the switchers' set of outside bank in Column III. In Column IV we compare the rate of switching loans with the rate of non-switching loans obtained by the same firm, excluding non-switching loans given by the outside bank. We match on the indicated variables. All variables are defined in Table III. We regress the spreads on a constant and report the coefficient on the constant. We weigh each observation by one over the total number of comparable nonswitching loans per switching loan. We cluster at the switching-firm level and report robust standard errors between parentheses. We also report the difference between the mean interest rate on the switching loans and the mean interest rate on the nonswitching loans in each column. We report standard errors between parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, two-tailed.

| | *Switching* | *First Transfer* | | |
|---|---|---|---|---|
| Period since the branch closure | Before | 1-6 months after | 7-12 months after | >12 months after |
| Number of switching / first transfer loans | 208 | 33 | 18 | 110 |
| Number of nonswitching loans | 800 | 196 | 91 | 501 |
| Number of observations (matched pairs) | 964 | 199 | 91 | 604 |
| Interest rate difference with matching | -75.22*** | 5.35 | 60.14 | -114.53*** |
| | (23.74) | (49.11) | (48.71) | (28.36) |
| Interest rate difference without matching | -126.08*** | -115.79** | -27.32 | -85.00 |
| | (23.88) | (44.51) | (108.35) | (138.00) |

TABLE A.3. **Spreads between Interest Rates on Switching or First Transfer Loans and Matched Nonswitching Loans Given by the Outside Bank When the Closest Branch of the Inside Bank Closes Before December 2014.** We assess the spread between the interest rate on switching or first transfer loans and the interest rate on new nonswitching loans obtained from the switchers' outside bank (by other firms) when the closest branch of the inside bank closes. We match on the variables indicated in Column III of Table IV. All variables are defined in Table III. We regress the spreads on a constant and report the coefficient on the constant. We weigh each observation by one over the total number of comparable nonswitching loans per switching or first transfer loan. We cluster at the switching-firm level and report robust standard errors between parentheses. We also report the difference between the mean interest rate on the switching or first transfer loans and the mean interest rate on the nonswitching loans in each column. We report standard errors between parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, two-tailed.

## Appendix B

| | *Switching* | *Later Transfer* | | |
|---|---|---|---|---|
| Period since the branch closure | Before | 1-6 months after | 7-12 months after | >12 months after |
| Number of switching / later transfer loans | 208 | 3 | 29 | 48 |
| Number of nonswitching loans | 800 | 10 | 96 | 180 |
| Number of observations (matched pairs) | 964 | 10 | 175 | 356 |
| Interest rate difference with matching | -75.22*** | 82.65 | -128.29* | -91.61*** |
| | (23.74) | (42.31) | (66.15) | (28.08) |
| Interest rate difference without matching | -126.08*** | -225.26** | -257.97*** | -300.08*** |
| | (23.88) | (50.68) | (48.24) | (43.10) |

TABLE A.4. **Spreads between Interest Rates on Switching or Later Transfers and Matched Nonswitching Loans Given by the Outside Bank When the Closest Branch of the Inside Bank Closes Outside Lisbon and Porto.** We assess the spread between the interest rate on switching or later transfer loans and the interest rate on new nonswitching loans obtained from the switchers' outside bank (by other firms) when the closest branch of the inside bank closes. We match on the variables indicated in Column III of Table IV. All variables are defined in Table III. We regress the spreads on a constant and report the coefficient on the constant. We weigh each observation by one over the total number of comparable nonswitching loans per switching or first transfer loan. We cluster at the switching-firm level and report robust standard errors between parentheses. We also report the difference between the mean interest rate on the switching or first transfer loans and the mean interest rate on the nonswitching loans in each column. We report standard errors between parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, two-tailed.

| | | | *Benchmark* | |
|---|---|---|---|---|
| Matching Variables | I | II | III | IV |
| Quarter | Yes | Yes | Yes | Yes |
| Inside bank | Yes | Yes | | |
| Outside bank | | | Yes | |
| Foreign bank | | Yes | | |
| Firm | | | | Yes |
| Credit rating | Yes | Yes | Yes | Yes |
| Region | Yes | Yes | Yes | Yes |
| Industry | Yes | Yes | Yes | Yes |
| Legal structure | Yes | Yes | Yes | Yes |
| Collateral | Yes | Yes | Yes | Yes |
| Loan maturity | Yes | Yes | Yes | Yes |
| Loan amount | Yes | Yes | Yes | Yes |
| Floating loan rate | Yes | Yes | Yes | Yes |
| Number of switching loans | 3,197 | 2,218 | 3,392 | 1,095 |
| Number of nonswitching loans | 15,140 | 9,875 | 10,668 | 2,442 |
| Number of observations (matched pairs) | 22,668 | 13,510 | 13,949 | 5,553 |
| Interest rate difference with matching | -117.08*** | -98.30*** | -61.27*** | -95.41*** |
| | (9.16) | (9.43) | (6.85) | (15.27) |
| Interest rate difference without matching | -117.08*** | -80.37*** | -38.53*** | -61.80 |
| | (8.62) | (12.54) | (10.56) | (38.04) |

TABLE B.1. **Spreads between Interest Rates on Switching Loans and Matched Nonswitching Loans Given by Inside or Outside Banks Outside of Lisbon and Porto.** We assess the spread between the interest rate on switching loans and the interest rate on new nonswitching loans obtained (by other firms) from the switchers' set of inside banks in Column I and II and from the switchers' set of outside bank in Column III. In Column IV we compare the rate of switching loans with the rate of non-switching loans obtained by the same firm, excluding non-switching loans given by the outside bank. We match on the indicated variables. All variables are defined in Table III. We regress the spreads on a constant and report the coefficient on the constant. We weigh each observation by one over the total number of comparable nonswitching loans per switching loan. We cluster at the switching-firm level and report robust standard errors between parentheses. We also report the difference between the mean interest rate on the switching loans and the mean interest rate on the nonswitching loans in each column. We report standard errors between parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, two-tailed.

| | *Switching* | *Transfer* | | |
|---|---|---|---|---|
| Period since the branch closure | Before | 1-6 months after | 7-12 months after | >12 months after |
| Number of switching / transfer loans | 125 | 43 | 48 | 161 |
| Number of nonswitching loans | 497 | 210 | 213 | 571 |
| Number of observations (matched pairs) | 591 | 217 | 304 | 833 |
| Interest rate difference with matching | -90.80*** | 10.60 | -72.38 | -94.30*** |
| | (32.93) | (37.58) | (50.84) | (18.56) |
| Interest rate difference without matching | -135.60*** | -132.92*** | -147.44 | -299.99*** |
| | (29.33) | (37.57) | (90.32) | (25.70) |

TABLE B.2. **Spreads between Interest Rates on Switching or Transfer Loans and Matched Nonswitching Loans Given by the Outside Bank When the Closest Branch of the Inside Bank Closes Outside Lisbon and Porto.** We assess the spread between the interest rate on switching or transfer loans and the interest rate on new nonswitching loans obtained from the switchers' outside bank (by other firms) when the closest branch of the inside bank closes. We match on the variables indicated in Column III of Table IV. All variables are defined in Table III. We regress the spreads on a constant and report the coefficient on the constant. We weigh each observation by one over the total number of comparable nonswitching loans per switching or transfer loan. We cluster at the switching-firm level and report robust standard errors between parentheses. We also report the difference between the mean interest rate on the switching or transfer loans and the mean interest rate on the nonswitching loans in each column. We report standard errors between parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, two-tailed.

| | *Switching* | *Later Transfer* | | |
|---|---|---|---|---|
| Period since the branch closure | Before | 1-6 months after | 7-12 months after | >12 months after |
| Number of switching / later transfer loans | 125 | 6 | 28 | 61 |
| Number of nonswitching loans | 497 | 16 | 96 | 286 |
| Number of observations (matched pairs) | 591 | 16 | 175 | 516 |
| Interest rate difference with matching | -90.80*** | -81.96 | -125.58 | -81.09*** |
| | (32.93) | (74.82) | (69.77) | (27.40) |
| Interest rate difference without matching | -135.60*** | -256.73*** | -212.79*** | -345.17*** |
| | (29.33) | (59.10) | (49.01) | (28.66) |

TABLE B.3. **Spreads between Interest Rates on Switching or Later Transfers and Matched Nonswitching Loans Given by the Outside Bank When the Closest Branch of the Inside Bank Closes Outside Lisbon and Porto.** We assess the spread between the interest rate on switching or later transfer loans and the interest rate on new nonswitching loans obtained from the switchers' outside bank (by other firms) when the closest branch of the inside bank closes. We match on the variables indicated in Column III of Table IV. All variables are defined in Table III. We regress the spreads on a constant and report the coefficient on the constant. We weigh each observation by one over the total number of comparable nonswitching loans per switching or first transfer loan. We cluster at the switching-firm level and report robust standard errors between parentheses. We also report the difference between the mean interest rate on the switching or first transfer loans and the mean interest rate on the nonswitching loans in each column. We report standard errors between parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, two-tailed.

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