Main bank power, switching costs, and firm performance. Theory and evidence from Ukraine

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Abstract

We examine firms' motivation to change their main bank and how this switch affects loans, interest payments and firm performance after switching. Applying treatment effect analysis on unique firm-bank matched Ukrainian data, we find that larger and highly leveraged companies are more likely to switch their main bank. Importantly, firms tend to switch to a new main bank which holds a higher share of equity in the firm and thereby has stronger power. The results also suggest that firms after switching obtain additional access to bank loans but have on average lower profits due to increased interest payments.

1 Introduction

Modern banking theory suggests that firms and financial intermediaries are interested in long-term and stable relationships which facilitate efficient usage of loans. Increased access to capital is frequently attributed to close links between clients and their bank which reduce asymmetric information. While a close firm-bank relationship is advantageous to both parties, the firm and the bank (Boot, 2000), strong bank-firm ties can also have adverse effects on firms. Bank could accrue monopoly power because of having access to private information about firms.[1] Banks can also take advantage of their unique position and benefit from their power by diverting income away from a firm via financing costs.

Generally, firms are more likely to switch to a new bank when they face severe financial constraints that are not solved by the current main bank. When considering switching, firms face trade-offs by comparing advantages of keeping the relationship with their "inside" bank against the potential benefits (e.g., increased access to loans) of changing to a new bank.[2] However, as the main bank has an informational advantage, it might be able to impede switching to a rival bank, thus creating a lock-in problem for firms (Kim, Kliger and Vale, 2003).

This issue is particularly important for emerging markets economies because of three equally important reasons. First, firms in these countries do not have long-term credit histories and established market reputations (Singh, 2003). Second, underdeveloped capital markets cannot provide acceptable substitutes for bank lending and, hence, firms are more vulnerable to turmoil in the banking sector (Shen and Huang, 2003). Finally, greater uncertainty and information asymmetry between agents increase switching costs (Hoshi, Kashyap and Sharfstein, 1990; Stephan, Talavera and Tsapin, 2011).

This paper's goal is to explore conditions under which firms are likely to switch their main bank and how this change affects firms' post-switching performance. Taking into account that banks can extend their influence by holding equity in non-financial corporations and, thereby, reduce switching costs, main bank power (MBP) should be an essential determinant of bank switching. To the best of our knowledge, this issue has not yet been examined in the context of emerging markets. We fill this gap in the literature by

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[1]The so-called "holdup' problem" is discussed in detail in Rajan (1992) and von Thadden (2004).

[2]Throughout the paper, we use the terms "inside" and "main" bank interchangeably.

matching unique data on firms and their owners with information on their main banks. We suggest that the particular features of underdeveloped financial markets facilitate a better understanding of the nature of the firm-bank relationship.

Another contribution of our study is to implement a sophisticated econometric analysis to address a number of issues. First, most of known studies have made use of a static econometric specifications, while we aim to enrich the econometric specification by introducing a "more dynamic" view of firm-bank relationship. Our unique data cover a longer period (five years) during which companies make decisions about switching bank. Second, applying for additional bank loans and the switching decision might be made simultaneously. Therefore, there is a need to make use of techniques that address endogeneity bias which has been rarely done in the existing literature.

Our analysis is based on two data sources. First, our firm-level data include detailed information on the self-reported firm's main bank, its balance sheets and income statements of Ukrainian open joint stock companies which are collected by the State Commission on Securities and Stock Market. Second, financial reports of Ukrainian banks are taken from the official site of the National Bank of Ukraine. We have linked about 150 banks with more than about 4,500 non-financial corporations during 2002-2006.

Our principal findings are that (i) bank ownership as well as foreign affiliation of main bank are key determinants of bank switching; (ii) larger and more leveraged companies are more likely to switch their main bank, favoring smaller banks with worse financial status; (iii) banks on average increase availability of loans to firms that have changed main bank but charge higher interest rates; (iv) firms tend to be less profitable after switching.

The next section discusses the relevant literature and outlines the specific hypotheses to be tested. Section 3 presents the data and the econometric methodology used in the analysis. The main results are summarized in Section 4, and the final section of the paper contains our conclusions.

2   Literature Review

The decision to shift to another financial service provider depends on a variety of factors, but switching costs is one of the most important elements. This is particularly true for the

banking industry, in which these costs appear to be significant. For instance, Kim et al. (2003) claim that switching cost equals to about one third of the market average interest rate on loans. Changing financial intermediaries requires substantial efforts by company managers who may experience transaction costs in opening new accounts, costs of learning to work with new agents, and uncertainty about the quality of the new financial intermediaries (Sharpe, 1990). The act of switching might also signal to the bank that the firm is facing financial constraints.

At the same time the insider bank has an informational advantage in the retention of important clients. When high quality clients switch to uninformed banks, they are pooled with low quality borrowers and could face unfavorable loan terms and have to pay the lemon's premium (Sharpe, 1990; Rajan, 1992). This leads to uneven competition for funds between inside and outside lenders for supplying financing. However, the theoretical model by von Thadden (2004) predicts only limited informational capture of borrowers in bank-firm relationship, with interest rates above market ones and occasional switching to other banks. Schenone (2010) explores links between information-releasing events and loan rates. She finds some evidence of hold-up only before but not after IPO. Additionally, a switch between credit suppliers may also entail unobserved costs related to the loss of capitalized value of the previously established relationship (Kim et al., 2003). Therefore, sufficiently high switching costs might result in increasing the monopoly power of banks (Klemperer, 1995).

Furthermore, the effects of asymmetric information on changing the main bank leads to information and graduation hypotheses (Gopalan, Udell and Yerramilli, 2011). The former states that informationally opaque firms or firms with low performance prefer to stay with their current bank (Berger, Miller, Petersen, Rajan and Stein, 2005). These banks are likely to be smaller ones which process soft information. Notably, when information asymmetry decreases, firms are more likely to make a switching decision. In contrast, the graduation hypothesis states that in the process of growth when firm size and reputation increase, firms are likely to switch to a larger bank. At the same time, large firms that have already built long bank-firm relationship prefer to stay with their current bank. Thus, a non-linear link between informational opaqueness and the likelihood of switching banks can be expected.

The importance of long-term bank-firm relationship is controversial. For example, long term links with banks reduce collateral requirements (Berger and Udell, 1995; Boot, 2000) and increase credit availability (Elsas and Krahnen, 1998). Increased main bank power and close bank-firm relationships attenuate information asymmetry and lower agency costs (Buch, 1998; Agarwal and Elston, 2001). There are also several papers that do not find benefits from bank-firm long term relationship, and even disclosure disadvantages of this phenomenon. Weinstein and Yafeh (1998) find that firms with longer main bank relationships have higher interest payments and lower profitability. Yao and Ouyang (2007) explain the worse financial performance of firms by the specific behavior of main banks, which try to stabilize their own earnings by forcing clients to over-borrow. In summary, banks can influence a firm's financing decisions to the bank's benefit. Thus, higher main bank power can be associated with higher loan ratios but goes along with worse profitability.

There are a number of other factors, affecting the length of bank-firm relationship and switching the main bank. Farinha and Santos (2002) find that the likelihood to switch bank increases with the duration of the relationship. Switching costs are also likely to vary with the customer type. Banks find difficulties to control large firms with good reputation and credit quality, meaning that this type of firms have considerably lower switching costs compared to smaller firms of lower quality (Hubbard, Kuttner and Palia, 2002). Small, young and highly leveraged firms are likely to switch banks more often (Ongena and Smith, 2001).

Another important reason for switching might be linked to firms' perceived post-switch benefits (Gopalan et al., 2011). Farinha and Santos (2002) find three essential ex-post effects: indebtedness, investment, and profitability (performance). Ioannidou and Ongena (2010) argue that the main reason firms switch bank is to obtain better credit conditions. For instance, the offer of a soft loan may be sufficient motivation for a firm to switch from one bank to a competitor. Vesala (2007) states that especially at the early stages of the lending relationship, banks have some incentive to subsidize greater loan availability for clients who have switched to that bank. Moreover, firms might resist the monopoly power of the "inside" bank by threatening to turn to an alternative source of finance.

Switching to another bank could also be blocked by the firm's owners. Morck, Nakamura and Shivdasani (2000) note that in many countries banks can own companies and, thereby, exert a substantial corporate governance role. Since creditors' interests often differ from those of other shareholders, excessive bank influence may lead to wealth redistribution from the non-financial to the banking sector. Providing that this mechanism of ownership redistribution is effective, and that switching costs are sufficiently low, it is plausible to assume that firms will switch to the bank that owns them.

The costs and benefits of switching vary depending on firm and bank characteristics. Banking with a "weak" bank may reduce a borrower's creditability because bank distress as well as its capitalization are significant barriers for lending. Fukuda, Kasuya and Nakajima (2005) emphasize that banks with a large proportion of nonperforming loans may behave riskier. They are likely to continue providing financial support to inefficient companies, which could be one important reason that firms tend to be attracted by banks with impaired balance sheets. In this context, we point out that the predicted effect of switching is crucially dependent on the motivation for such behavior. If a company takes the initiative to switch main bank, the decision has quite possibly been taken in the expectation of a positive outcome; however, if the bank switch is a direct result of changes in the structure of firm ownership, the rent-seeking motive of the bank may result in worse performance of the firm.

Finally, the structure and development of financial system play a crucial role for the bank-firm links. For instance, the problem of high switching costs could be mitigated in competitive financial markets as there are more alternatives to choose from if the firm's current financial institution is abusing its power (Elsas, 2005). Sufficient competition and entrance of foreign banks prevents the misallocation of funds to unprofitable investments and mitigates the impact of a financial crisis on the real sector, providing mutual benefits from the firm-bank relationship (Rajan and Zingales, 1998). Exploring a panel of Eastern European countries, Giannetti and Ongena (2008) find that relationships with foreign banks are less likely to be terminated than relationships with other banks. Furthermore, the asymmetric information costs are particularly high in emerging market countries in which firm-level accounting transparency is low and sharing of information among banking institutions is minimal (Brown, Jappelli and Pagano, 2009).

3   Ukrainian banking system and bank switching

The establishment of modern Ukrainian banking system traces back to 1991, following the adoption of the Law of Ukraine "On Banks and Banking". The banking system is constructed as a two-tiered structure that consists of the National Bank of Ukraine (NBU) that serves as both the country's central bank and bank regulator, and commercial banks.

Starting from January 1998, the banking system of Ukraine has been transferring to the international accounting and statistics standards (International Financial Reporting Standards). During 2001-2006 the NBU implemented several important amendments to improve the lending capacity of bank system. Specifically, the NBU raised the minimum capital adequacy ratio, tightened the requirements to lending regulations and introduced a new risk assessment methodology.

The improved transparency of Ukrainian banks accompanied by favorable macroeconomic conditions (high GDP growth rates, decrease in inflation rate and an increase in demand for credit resources) made it possible for banks to demonstrate rapid growth during the period of the study. Bank credits have been increasing by up to 50% annually between 2002 and 2006 that is appears to be notable change, even after accounting for inflation growth. Despite of this fast growth the credit activity of the banks could not keep pace with the growth of their capital and Ukrainian banking sector continued to operate far below its potential comparing to its peers from developed countries. Starting from 2001 bank lending illustrated a market shift from short- to long-term loans (over one year). The long-term credit share increased from 21.7 percent in 2002 to 61.8 percent in 2006 that could be considered as a consequence of a macroeconomic stabilization.

However, the excessive demand on long-term financing caused a problem for banking institutions as they faced difficulty aligning the duration between assets and liabilities. The reason was that both households and firms prefer short-term deposits due to the lack of confidence and considerable uncertainty, while firms tried extending long-term financing that caused considerable mismatch between bank assets and liabilities. This situation gave a push for banks to secure own sources of funds in order to lessen the dependence on deposits. In 2003 Ukrainian banks started obtaining syndicate credits and getting access to international capital markets with Eurobonds; however, this had a

significant impact on the structure of capital sources only after 2006.

Additionally, as corporate bond and equity markets were still in the infancy stages of development, banks preferred competing with each other over credit terms, rather than on the basis of interest rates (Stephan et al., 2011). Another way to stabilize earnings for Ukrainian banks was to grasp new clients through equity ownership. Note that the majority of existing banks served the needs of individual firms or business groups that affected considerably the probability of bank switching.

Although, the number of commercial banks increased dramatically during the transformation from the Soviet Union to independent Ukraine, a few banks still retained a huge market share in 2006. Top ten banks possessed more than half of total assets, credits, and liabilities and they were able to attract more than half of the total funds of economic agents. The largest banks received about one half of the total income of Ukrainian banks. Apparently, the high concentration ratio affected noticeably on the real sector and bank switching in particular. Weak banks were not able to compete with their largest counterparts and lost their most promising clients. Such process is considered to be common for transitional countries.

Presidential elections in 2004 jeopardized the whole financial system as it generated a lot of negative expectations. NBU lost about 25 percent of its international reserves. The great problem with sector liquidity was caused by reallocation of funds and households' withdrawing 17 percent of their total deposits. However, in 2005 the international reserves were filled up soon as the prudent monetary policy and tightening the fiscal discipline recovered the confidence in banks. Despite some disturbances the banking system was relatively stable during the period of study as most of banks had managed to keep their market shares.

Ukrainian banks were mostly domestically owned only nine of them had 100 percent of foreign capital in 2005. Foreign banks became to be influential after 2005, since the relative transparency of Ukrainian banks together with strong growth led to the subsequent purchase of several large and medium banks by foreign investors in 2005–2008. The foreign capital entry increased the capacity of the bank system. This is important due to the fact that economic agents favored borrowing in foreign currencies to reduce the volatility of interest payments. Apparently, the foreign banks made the competition on

both deposits and credit markets stronger that resulted in numerous corporate decisions to switch main banks.

4 Data and methodology

4.1 Data

The basic source of the data for corporate characteristics is the SMIDA (State Commission on Securities and Stock Market) database. Financial reports of Ukrainian banks are taken from the official site of the National Bank of Ukraine. We match the two samples based on names and unique codes of main banks which are self-reported by the firms in their financial reports. The sample period is from 2002 to 2006. Only economically active firms (i.e., companies with positive sales values) are retained in our sample, and we also exclude all firms that are observed only one year. Moreover, to lessen the influence of outliers, the variables are truncated at the top and bottom 1 percent level of the distribution on an annual basis. Our final sample contains approximately 150 banks and about 4,500 corporations.

Table 1 sets out descriptive statistics for selected variables referring to firms and banks for the period 2002-2006. Our data reveal that there has been switching in about 9 per cent of firm-years. This corresponds to 744 switchings of the main bank as reported by firms. The possibility of multiple or additional banks is excluded because only one bank can be declared as the main bank in the form submitted to the SMIDA database. Additionally, firms in our sample are profitable with a 8.8 percent of operating income (loss) to total sales ratio. *Leverage* indicates that the mean of the firm's debt is about 37.7 percent of total liabilities, and Ukrainian firms use 12.6 percent of bank loans to structure their debts. Note that the mean of *Interest Payment* (0.211) is comparable to the weighted interest rate on credit in the national currency granted by commercial banks in Ukraine during the period of investigation as reported by the State Statistics Committee of Ukraine.[3] About seven percent of the joint stock companies (11 percent of observations) report that the State is one of the main shareholders while only five percent of firms are controlled by

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[3]See http://ukrstat.gov.ua/operativ/operativ2005/fin/pdbsu/pdbsu_e/pdbsu_e.html, retrieved on 14-03-2011.

banks holding equity. Our sample is comparable to the samples of Ukrainian firms used by other scholars (Giannetti and Ongena, 2009; Degryse, Laeven and Ongena, 2009). For example, Giannetti and Ongena (2009, Table 1, p. 189) employ the Amadeus database and their sample is quite similar to our.

Bank-specific indicators also provide interesting figures. First, we measure bank's size by the natural logarithm of total assets. This indicator tells us about bank's capacity to attract financial resources (alternatively, one could use the number of bank branches). Second, a bank's leverage characterizes the bank's capacity to accumulate financial resources and transform deposits into credits. An average (median) Ukrainian bank maintains the ratio of deposits and borrowing to total assets equal to 0.84 (0.87). Finally, about 4 percent of our firms are owned by foreign banks. We manage to identify 10 foreign banks which hold on average 33 percent of equity of their clients.

Table 2 compares the firm and bank characteristics one year before and one year after switching. Our data reveal that switching does not really affect the key firm indicators, but there are some interesting differences between old and new banks. In particular, we find that firms are more likely to switch to banks which increased ownership which is in line with recent evidence (e.g., Gopalan et al., 2011). Moreover, new banks are likely to be less leveraged and more likely to be foreign-owned.

4.2   Empirical modeling

The question of whether or not to switch bank and the decision about obtaining more bank loans might be interrelated. Moreover, some companies are more likely to switch the main bank because the new bank has ownership in the firm. Therefore, a more traditional analysis defining the switching dummy variable as an exogenous effect potentially suffers from self-selection bias.[4] One possible modeling strategy for coping with this problem is to use Heckman's selection model by including an endogenous treatment effect dummy variable (treatment effect model, TEM in the following). As we have panel data, our empirical strategy follows Verbeek (1990), Verbeek and Nijman (1992), who sug-

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[4]Most studies assume independent or sequential decisions on credit, its maturity, and switching (Ioannidou and Ongena, 2010). However, neglecting the possible joint character of loan decisions may lead to biased estimates.

gest employing Heckman type sample selection models with fixed and random effects in order to capture not only the selection decision of firms regarding bank switching, but also unobserved heterogeneity across firms both in the switching decision as well as in the outcome after switching.

The outcome equation including the endogenous dummy variable for bank switching is specified for panel data as

$$y_{it} = \theta_i + \beta' x_{it} + \mu Switch_{it} + \psi_t + \varepsilon_{it}$$

where the subscript i refers to firms and the subscript t to periods. y_{it} is defined as outcome, e.g., interest payment or firm performance, x_{it} is a vector containing variables describing firm and main bank characteristics, θ_i is a firm specific random or fixed effect, and ψ_t is a set of time fixed effects. The key variable of our analysis is $Switch_{it}$ which indicates switching of main bank from period $t-1$ to period t. The parameter μ describes the effect of bank switching on the outcome variable y_{it}.

Given the endogeneity of a firm's switching decision we model the probability to switch bank as

$$Switch_{it}^* = \eta_i + \delta' w_{it} + u_{it}$$

with

$$Switch_{it} = 1 \text{ if } Switch_{it}^* > 0 \text{ and } Switch_{it} = 0 \text{ if } Switch_{it}^* \leq 0.$$

and $\eta_i \sim N\left[0, \sigma_\eta^2\right]$, $\theta_i \sim N\left[0, \sigma_\theta^2\right]$, $Corr(\varepsilon_{it}, u_{it}) = \rho$, $Corr(\theta_i, \eta_i) = \delta$ for the sample selection model with *random effects* (RE TEM model).[5] The vector w_{it} includes the firm and bank related variables.

The standard regression model produces biased estimates if $\rho \neq 0$. Unobservable factors determine the switching of the main bank due to "selectivity" in two forms, that is through the correlation of the individual-specific unique components (ε_{it} and u_{it}) and through the correlation between the group-specific components (θ_i and η_i).

More specifically, our model proposes the following selection equation for estimating the probability of a firm's main bank switch:

$$Switch_{it} = \eta_i + \delta_1 (FirmSize)_{it-1} + \delta_2 (FirmLeverage)_{it-1} + \delta_3 (LargestOwner) \quad (1)$$

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[5]For the sample selection model with *fixed effects*, one specifies $[u_{it}, \varepsilon_{it}] \sim$ bivariate normal $[(0,0), 1, \sigma, \rho]$.

$$+ \quad \delta_4 (BankPower)_{it} + \delta_5 (BankSize)_{it} + \delta_6 (BankLeverage)_{it}$$
$$+ \quad \delta_7 (ForeignBank)_{it} + \psi_t + u_{it}$$

The choice of right hand side variables is motivated by previous research. The likelihood of switching increases if the switching costs are considerably reduced and the main bank's influence weakens. According to the information hypothesis, growing firms become less opaque and more likely to switch banks (Gopalan et al., 2011). At the same time, companies with higher leverage are regarded as those with worse financial health and, therefore, they also are more prone to change their bank (Ongena and Smith, 2001). Thus, both parameters δ_1 and δ_2 should be positive. The graduation hypothesis, however, predicts a non-linear link between firm size and the likelihood of switching, therefore the sign of δ_1 could be ambiguous.

The next group of variables allows us to control for possible agency costs and assessing the bargaining power of a firm against its main bank in negotiating contracts. Specifically, a firm with dispersed ownership structure has a higher probability of agency conflicts that weakens the firm's position and results in higher switching costs. Apparently, δ_3 is predicted to be positive because higher ownership concentration (represented by *Largest Owner*) makes the bank switching decision easier to realize.

Financial intermediaries that own firm shares can have a direct impact on the firm by manipulating the firm's financial decisions, and on bank switching in particular. The empirical literature suggests several measures of bank influence. For instance, Sheard (1989) and D'Auria, Foglia and Reedtz (1999) use the amount of bank loans to measure the closeness of a firm-bank relationship. However, this indicator does not seem completely reliable because receiving a large loan may have adverse effects on the firm and may not necessarily give the bank significant influence over the client. Instead, we use change of bank ownership in the firm to estimate the main bank's power. Morck et al. (2000) argue that bank power can be significantly increased owing to higher levels of bank equity ownership. Hoshi et al. (1990) note that share ownership allows banks to reap more benefits in case of concentrated bank borrowing. We believe that an increase in the control of the firm via higher shareholding by the bank will encourage the firm to switch its banking to the respective bank. Therefore, δ_4 is expected to be positive.

As we have already mentioned in the Section 2, bank characteristics also play a cru-

cial role in bank changing decisions of firms' managers. In particular, a higher ratio of *Bank Leverage* implies more resources that the bank can use to grant more loans to clients. Similarly, larger banks have stronger balance sheets and more likely to provide necessary financing. Thus, δ_5 and δ_6 are predicted to have positive signs if firms choose healthier banks. We also assume that foreign banks are more capable to attract new clients because they are likely to enjoy positive reputation effects. To capture this influence we distinguish between domestic and foreign financial institutions and expect δ_7 to be positive.

Performance

To check whether switching affects firm performance, we model a firm's performance as a function of several variables. In particular, we are interested in the sign and statistical significance of the coefficient μ in the following equation

$$
\begin{aligned}
Performance_{it} \;=\; & \eta_i + \beta_1(FirmSize)_{it} + \beta_2(SalesGrowth)_{it} \\
+ \; & \beta_3(State)_{it} + \beta_4(LargestOwner)_{it} + \beta_5(BankPower)_{it} \\
+ \; & \mu(Switch)_{it} + \varsigma_t + \epsilon_{it}.
\end{aligned}
\tag{2}
$$

where η_i denotes unobserved firm-specific heterogeneity with regard to firm performance and ς_t are time (year) effects. The parameter μ indicates the impact of the switching decision on performance. A positive (negative) effect on performance implies that bank switching leads to better (worse) performance.

We expect negative link between changes in bank ownership *Bank Power* and firm profitability because strong banks can take advantage of their monopoly status and exploit firms. To control for possible agency conflicts we employ ownership concentration (*Largest Owner*). Concentrated ownership makes it possible to monitor management discretion thereby reducing agency costs and leading to a better firm performance (Claessens and Djankov, 1999). In contrast, the presence of the State among principle shareholders may indicate worse firm performance because state-owned firms may waive profit maximization in the pursuit of social or political aims (Dewenter and Malatesta, 2001). To control for economies of scale we have introduced firm size into our regression specification. Finally, growth of sales (*Growth*) is a measure of investment opportunities and is expected to be positively correlated with a firm's return (Yao and Ouyang, 2007).

Bank loan ratio

Besides performance, we next explore whether switching also affects availability of bank loans. Our data reveal that only a fraction of companies in our sample show non-zero values for bank loans, measured as the ratio of bank loans to total debt. In this case, the dependent variable is censored at zero and using a Tobit model with endogenous treatment effect dummy variable is an appropriate empirical strategy. We estimate the following outcome equation for bank loans:

$$
\begin{aligned}
BankLoan_{it} \;=\; & \eta_i + \beta_1(FirmSize)_{it} + \beta_2(SalesGrowth)_{it} + \beta_3(Volatility)_{it} \quad (3) \\
& + \; \beta_4(State)_{it} + \beta_5(LargestOwner)_{it} + \beta_6(BankPower)_{it} \\
& + \; \mu(Switch)_{it} + \varsigma t + \epsilon_{it}
\end{aligned}
$$

We expect μ to be positive because facilitating access to bank financing is the key motivation of clients to change bank (Vesala, 2007). Main bank power is likely to positively affect the client loan ratio (Agarwal and Elston, 2001). Furthermore, we expect that larger firms will borrow more because they are more lucrative clients for the current main bank.

Interest payment

Our final post-switching equation employs interest payment to bank loans ratio (*Interest Payment*) as the dependent variable:

$$
\begin{aligned}
InterestPayment_{it} \;=\; & \eta_i + \beta_1(FirmSize)_{it} + \beta_2(SalesGrowth)_{it} + \beta_3(Volatility)_{it} \quad (4) \\
& + \; \beta_4(State)_{it} + \beta_5(LargestOwner)_{it} + \beta_6(BankPower)_{it} \\
& + \; \mu(Switch)_{it} + \varsigma t + \epsilon_{it}
\end{aligned}
$$

Based on the discussion above, we predict a positive sign for the coefficient of *Switch* because new borrowers might be considered as riskier (Sharpe, 1990). This result is expected to persist after controlling for borrower risk and for borrower information costs. *Volatility* is proxy for the riskiness of companies, while *Firm Size* and *Sales Growth* characterize information and control issues.

5 Empirical results

5.1 Why do firms switch their main banks?

The estimates for the determinants of switching probability are shown in tables 3 and 4, where marginal effects at mean values are reported. We report results for the pooled TEM and for the random effects TEM. In addition, results for the Tobit TEM in case of bank loans and interest payments as dependent variables are reported.[6] The outcomes provide evidence that the probability of switching main bank (hence, the unobserved switching costs) is determined by both firm- and bank-specific characteristics. One of the key variables of this study, *Bank Power*, turns out to be a significant determinant of bank switching in both cases (pooled treatment effect model and random effects model). As the treatment effect models indicate, the probability of switching to a new main bank increases 2 percent if the new bank has purchased 1 percent of a firm's equity.

Notably, firms tend to initiate new relationship with a foreign bank, which is possibly able to exploit the reputation of its mother bank (Stiglitz, 1989; Domanski, 2005). The coefficient for *Foreign Bank* shows that the characteristic of being a foreign bank is the most influential determinant for the probability of bank switching. The probability of switching decreases if the new bank is endowed with more capital. Banks with a lower capitalization and a weak ability to transform funds are more likely to attract new clients. It means that Ukrainian firms are inclined to switch to banks with deteriorated financial health. Apparently, weaker banks are more prone to serve riskier firms and clients which face severe financial constraints. This results is roughly consistent with Fukuda et al. (2005) who argue that banks may continue lending to troubled firms to keep them from bankruptcy in order to conceal own possible problems.

Despite the positive significant impact of firm size our findings do not support the graduating hypothesis, which implies that firms prefer larger banks when switching because such will be better able to meet the firms' growing need for funds (Gopalan et al., 2011). However, our study provides evidence to support the information hypothesis. More opaque companies are less likely to switch banks, as there is a positive relationship

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[6]For the fixed effects TEM it turns out that for the performance equation numerical problems occur and no solution can be obtained. The FE Tobit TEM results are available from the authors upon request.

between firm size and the probability of bank switching.[7] Typically, small firms are less transparent than larger ones, while larger companies are more diversified and thus less prone to bankruptcy (Rajan and Zingales, 1995). Finally, riskiness, measured by its leverage ratio, has predicted positive sign and is highly significant. This suggests that firms are more likely to switch banks in an effort to relax their financial constraints, a finding in accord with Detragiache, Garella and Guiso (2000).

In summary, our results suggest that larger but also riskier Ukrainian companies are more likely to break off their current bank relationship in order to initiate a new one with a smaller and less healthy or a foreign owned bank.

5.2   Ex-post effects of bank switching

The remaining question is whether bank switching leads to any difference in post-switch performance, access to bank loans, or the firm's interest payments.

Table 3 provides the estimates of the impact of bank switching from period $t-1$ to period t on firm performance in period t. Note that the coefficients on *Switch* are significant for all models. The selection correlation coefficient ρ is statistically significant, highlighting the appropriateness of applying selection models.

One of the most important results is that bank switching leads to lower profitability for Ukrainian corporations. A similar outcome is reported by Degryse and Ongena (2001). For the most part, our findings confirm most of the expected relations between a firm characteristics and its performance. In particular, firm size, as well as sales growth, are significant determinants of firm profitability. The results for the treatment effect models indicate furthermore that higher bank power is positively associated with firm's profitability.[8]

Table 4 shows the effects of switching on the amount of bank credits in the structure of firm debt. The correlation coefficient of the error terms (ρ) indicates that the coefficient of *Switch* (our major interest here, the treatment effect) is biased in regressions that

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[7]We can confirm this conclusion on the basis of outcomes obtained from regressions which employ access to bond market as a proxy for firm informational transparency. The results are available from the authors upon request.

[8]Morck et al. (2000) assert that bank ownership can improve firm value providing that the incentives of the bank and the shareholders are closely aligned.

do not account for self-selection. Thus, we cannot ignore the selection effect when interpreting the outcomes of our estimations. The main conclusion derived from this part of the empirical study is that Ukrainian firms obtain easier access to external funds after switching banks, a conclusion that is corroborated across alternative models and consistent with findings of Vesala (2007). This result remains after controlling for borrower risk, incentives, and information costs. Moreover, the estimated effect can be viewed as even stronger when taking into consideration that only loans of at least one year's duration are observed, whereas banks do provide other means of financing (e.g., short-term credit and credit lines).

Additionally, we find evidence of a statistically significant link between bank power and bank financing. A bank that purchases shares in the client firm tends to grant less credits to those firms. This result contrasts with a number of previous studies (see, e.g., Weinstein and Yafeh, 1998 or Yao and Ouyang, 2008). Banks may curtail lending for bank-dependent clients if they provide alternative services. Specifically, obtaining control over a firm through shareholding makes it possible for the banks to reduce monitoring costs and, thus, bank-owned firms can rely more on revolving loans or lines of credit. The latter conjecture is in line with evidence that firms prefer more short term debt if the main shareholder is a bank (Garcia-Teruel and Martinez-Solano, 2010).

Our results also show that banks tend to extract higher interest payments from switching firms, which is consistent with von Thadden (2004). Similarly, Ioannidou and Ongena (2010) argue that switching firms initially benefit from lower interest rates and hold-up effects are strengthened with the lapse of time. However, generally firms that switch bank are regarded as riskier ones and therefore these firms might not get additional loans at a competitive price. The estimation results show that interest payments are sensitive regarding the variability of a firm's internal funds. In particular, interest payments are higher for larger companies, while sales growth of the firm is immaterial. Moreover, if the main bank becomes a principal shareholder of the firm, these firms get significantly lower interest rate on their loans. In summary, main bank switching increases the availability of capital for the firm but worsens its performance at the same time, most likely due to the fact that the new bank charges higher interest rates.

6 Conclusions

More than five percent of the joint stock companies in Ukraine switch their main bank every year, but why they do so is unclear, making it a phenomenon well worth studying. Using a matched firm-bank sample, our study provides evidence that firm characteristics as well as the new bank's financial health are the most important determinants for bank switching in this transition economy. Riskier and larger Ukrainian companies have a higher likelihood to change their bank, usually moving to a bank with worse financial health. A possible explanation why firms choose weaker banks is that these banks are more prone to grant risky credits or have better reputation as is the case for the foreign banks in our sample. However, these findings conflict with the graduating hypothesis, which states that companies tend to switch to larger banks that can better meet their growing need for more funds (Gopalan et al., 2011).

A core finding of this research is that firms show worse performance after switching, which is in accordance with Degryse and Ongena (2001). Apparently, firms that switch bank are seen as more risky and, therefore, the new bank charges higher interest on the loans for the firm. This is a reasonable behavior on the part of banks as von Thadden (2004) argues that particularly low-quality firms are more likely to switch banks. It would be very interesting to discover how permanent this poorer performance is and to what extent the bank financial health affects its loan conditions.

This study also highlights the essential role of main bank power, measured by the new bank's equity holdings in the firm, in encouraging firms to change to an "inside" bank. Apparently, switching to a new bank which holds equity in the firm reduces switching costs. In addition, we find evidence that main bank power has a positive effect on the firm's performance, while it reduces both the amount of a firm's bank loans and its interest payments. We interpret this finding that main banks create favorable loan conditions for firms under control (if the bank owns the firm) which positively affect firm performance. The lower bank loan ratio can be explained by the fact that we account for only the bank loans over one year, while a close firm-bank relationship (as an aftermath of the MBP) may reduce loan maturity in the long-run. But whether this conjecture is true is a question left for future research.

While strong bank power lowers a firm's switching costs to a new "inside" bank it might later on also create lock-in effects. This is of great relevance to policymakers in that financial institutions tend to choose inefficient structures in the absence of sufficient competition and this situation can result in wealth redistribution in developing countries from the non-financial to the financial sector (Rajan, 2002). To guard against banks having excessive power, many developed countries set limits on the amount of equity a bank can hold in a single firm (Morck et al., 2000). This type of regulation is rare in emerging markets so far, making non-financial corporations quite susceptible to shocks generated in financial sector. Furthermore, the introduction of public credit registry could substantially decrease asymmetric information and reduce the "hold-up" problem.

Our findings on the bank-firm relationship are unique in light of previous studies, which have not shown such interesting effects. As an important extension of the financial literature, we identify the key reasons why firms switch banks and as well as its impact on post-switch performance. Given these results, further exploration along these lines could shed considerable light on the strength of bank-firm relationship. In particular, important topics such as duration analysis, effects of getting the first loan, and multiple bank relationships are left for future explorations.

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Variable	Median	Mean	St.Dev	Min	Max
Switch	0	0.087	0.282	0	1
Firm Characteristics					
Performance	0.108	0.088	0.258	-2.376	0.833
Bank Loan	0	0.126	0.210	0	0.895
Interest Payment[a]	0.141	0.211	0.385	0	6.522
Firm Size	8.589	8.785	1.633	5.573	14.375
Firm TA	5,371.650	32,852.120	107,226.400	263.300	1,749,652.000
Sales Growth	1.136	1.254	0.717	0.051	8.263
Leverage	0.297	0.377	0.308	0.004	1.732
Volatility	1.815	1.728	1.123	-2.673	4.498
State	0	0.110	0.313	0	1
Largest Owner	42.773	46.238	24.892	0	100
Bank Characteristics					
Bank Power	0	-0.086	5.875	-88.795	99.708
Bank Size	16.177	15.668	1.509	7.649	17.335
Bank TA	10,602.720	11,926.880	9,352.809	2.098	33,777.210
Bank Leverage	0.854	1.099	3.854	0.006	88.554
Foreign Bank	0	0.133	0.339	0	1

N=8,514

Sources: The State Commission on Securities and Stock Market, The National Bank of Ukraine

Notes: *Firm characteristics*: *Performance* is constructed as operating income/loss to total sales ratio. *Bank Loan* denotes the share of bank loans in total debt. *Interest Payment* is defined as interest payments to bank loans ratio. *Size* is the natural logarithm of total assets (measured in 1,000 UAH). *Leverage* is the firm's debt to total assets ratio. *Sales Growth* is the growth of firm sales. *Volatility* is *ln* of standard deviation of the first difference of retained earnings divided by total assets. *State* is dummy variable which takes value of one if the state owns a substantial share of the firm and zero otherwise. *Largest Owner* is the percentage of firm's equity owned by the largest shareholder, in %.

Bank characteristics: *Bank Power* denotes the share of firm's equity purchased/sold by the main bank in current period, in %. *Bank Size* is measured by natural logarithm of total assets (measured in 1,000 UAH). *Bank Leverage* is defined as deposits and borrowing to total assets ratio.

[a] results for 3,643 observations are reported.

Table 2: Descriptive Statistics for Switching Firms Before and After Bank Switching

	Year Before Switching			Year After Switching			
Variable	*Median*	*Mean*	*Std.Dev.*	*Median*	*Mean*	*Std.Dev.*	*Z − Wilcoxon*
			Firm Characteristics				
Performance	0.099	0.078	0.268	0.104	0.083	0.282	0.362
Bank Loan	0	0.121	0.193	0	0.153	0.229	0.861
Interest Payment	0.154	0.267	0.655	0.130	0.193	0.257	-1.223
Firm Size	8.890	9.047	1.641	8.992	9.114	1.700	0.405
Sales Growth	1.170	1.365	0.923	1.158	1.274	0.708	-0.704
Leverage	0.328	0.405	0.319	0.370	0.429	0.312	1.268
Volatility	1.884	1.821	1.080	1.858	1.772	1.105	-0.375
State	0	0.103	0.305	0	0.118	0.323	0.638
Largest Owner	41.431	44.983	23.744	44.842	47.161	24.593	0.981
			Bank Characteristics				
Bank Power	0	-0.114	4.190	0	1.567	8.626	3.449***
Bank Size	16.102	15.349	1.443	15.621	15.214	1.573	-1.004
Bank Leverage	0.866	0.840	0.115	0.854	0.949	2.380	-4.230***
Foreign Bank	0	0.056	0.230	0	0.132	0.338	3.185***

Number of switches = 744

Sources: The State Commission on Securities and Stock Market, The National Bank of Ukraine

Notes: *Firm characteristics*: *Performance* is constructed as operating income/loss to total sales ratio. *Bank Loan* denotes the share of bank loans in total debt. *Interest Payment* is defined as interest payments to bank loans ratio. *Size* is the natural logarithm of total assets (measured in 1,000 UAH). *Leverage* is the firm's debt to total assets ratio. *Sales Growth* is the growth of firm sales. *Volatility* is *ln* of standard deviation of the first difference of retained earnings divided by total assets. *State* is dummy variable which takes value of one if the state owns a substantial share of the firm and zero otherwise. *Largest Owner* is the percentage of firm's equity owned by the largest shareholder, in %.

Bank characteristics: *Bank Power* denotes the share of firm's equity purchased/sold by the main bank in current period, in %. *Bank Size* is measured by natural logarithm of total assets (measured in 1,000 UAH). *Bank Leverage* is defined as deposits and borrowing to total assets ratio.

Table 3: Switching and firm performance with selection equation

	(pooled TEM)		(RE TEM)	
Dependent Variable:	(*Switch*)	(*Performance*)	(*Switch*)	(*Performance*)
Switch		-0.3277***		-0.3197***
		(0.0140)		(0.0125)
Firm Characteristics				
Firm Size	0.0647***	0.0124***	0.0637***	0.0115***
	(0.0115)	(0.0018)	(0.0116)	(0.0016)
Sales Growth		0.0415***		0.0416***
		(0.0039)		(0.0034)
Leverage	0.4434***		0.4395***	
	(0.0566)		(0.0585)	
State		-0.0798***		-0.0784***
		(0.0089)		(0.0070)
Largest Owner	0.0006	0.0003**	0.0006	0.0002**
	(0.0008)	(0.0001)	(0.0008)	(0.0001)
Bank Characteristics				
Bank Power	0.0201***	0.0010**	0.0201***	0.0010*
	(0.0031)	(0.0005)	(0.0027)	(0.0006)
Bank Size	-0.0703***		-0.0714***	
	(0.0122)		(0.0125)	
Bank Leverage	-0.0127*		-0.0115*	
	(0.0069)		(0.0063)	
Foreign Bank	0.1585***		0.1620***	
	(0.0571)		(0.0608)	
ρ	0.634**		0.654***	
Log Likelihood	-2,753.56		-2,703.60	
N	8,514		8,514	

Notes: TEM=treatment effect model. RE=random effects. Marginal effects are reported. Each equation includes year dummy variables. Standard errors are reported in the parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Firm characteristics: *Performance* is constructed as operating income/loss to total sales ratio. *Bank Loan* denotes the share of bank loans in total debt. *Interest Payment* is defined as interest payments to bank loans ratio. *Size* is the natural logarithm of total assets (measured in 1,000 UAH). *Leverage* is the firm's debt to total assets ratio. *Sales Growth* is the growth of firm sales. *Volatility* is *ln* of standard deviation of the first difference of retained earnings divided by total assets. *State* is dummy variable which takes value of one if the state owns a substantial share of the firm and zero otherwise. *Largest Owner* is the percentage of firm's equity owned by the largest shareholder, in %.

Bank characteristics: *Bank Power* denotes the share of firm's equity purchased/sold by the main bank in current period, in %. *Bank Size* is measured by natural logarithm of total assets (measured in 1,000 UAH). *Bank Leverage* is defined as deposits and borrowing to total assets ratio.

Table 4: Switching and bank loans / interest payments with selection equation

	(Tobit TEM)		(Tobit TEM)	
Dependent Variable:	*(Switch)*	*(Bank Loan)*	*(Switch)*	*(Interest Payment)*
Switch		0.3450***		0.5889***
		(0.0098)		(0.0186)
		Firm Characteristics		
Firm Size	-0.0003	0.0255***	0.0208	0.0094*
	(0.0122)	(0.0017)	(0.0163)	(0.0053)
Sales Growth		-0.0015		0.0074
		(0.0033)		(0.0093)
Leverage	0.2426***		0.0184	
	(0.0553)		(0.0732)	
Volatility		0.0006		0.0212***
		(0.0022)		(0.0061)
State		-0.0660***		0.0187
		(0.0077)		(0.0219)
Largest Owner	0.0013	-0.0002**	0.0013	-0.0003
	(0.0008)	(0.0001)	(0.0011)	(0.0003)
		Bank Characteristics		
Bank Power	0.0149***	-0.0018***	0.0113***	-0.0025**
	(0.0030)	(0.0004)	(0.0034)	(0.0012)
Bank Size	-0.0613***		-0.0437***	
	(0.0123)		(0.0160)	
Bank Leverage	-0.1131*		-0.1344	
	(0.0589)		(0.2363)	
Foreign Bank	0.1579***		0.0660	
	(0.0592)		(0.0722)	
ρ	-0.792***		-0.916***	
Log Likelihood	-513.47		-2,066.05	
N	6,518		2,850	

Notes:: TEM=treatment effect model. RE=random effects. Marginal effects are reported. Each equation includes year dummy variables. Standard errors are reported in the parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Firm characteristics: *Bank Loan* denotes the share of bank loans in total debt. *Interest Payment* is defined as interest payments to bank loans ratio. *Size* is the natural logarithm of total assets (measured in 1,000 UAH). *Leverage* is the firm's debt to total assets ratio. *Sales Growth* is the growth of firm sales. *Volatility* is *ln* of standard deviation of the first difference of retained earnings divided by total assets. *State* is dummy variable which takes value of one if the state owns a substantial share of the firm and zero otherwise. *Largest Owner* is the percentage of firm's equity owned by the largest shareholder, in %.

Bank characteristics: *Bank Power* denotes the share of firm's equity purchased/sold by the main bank in current period, in %. *Bank Size* is measured by natural logarithm of total assets (measured in 1,000 UAH). *Bank Leverage* is defined as deposits and borrowing to total assets ratio.