# Determinants of Bank Long-term Lending Behavior: Evidence from Russia

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We investigate the determinants of the banks' propensity to make long-term business loans in an emerging market context. Using a large sample of Russian banks, we find that the median bank allocates only 0.5% of its assets in long-term business loans and that there is wide cross-sectional variation in this ratio among banks. A bank's ability to extend long-term business loans depends on its size, capitalization, and the availability of long-term liabilities rather than its type of ownership. These results highlight the importance of bank-level (supply side) constraints in extending vital long-term credit to firms. (JEL: G21, O16)

**Keywords:** emerging market banking, long-term business loans, Russia

## I. Introduction

The theoretical and empirical finance literature suggests that the availability of bank credit in general and long-term credit in particular are important determinants of economic growth and development in emerging markets. Additionally, recent cross-country evidence shows that banks in these economies are reluctant to extend long-term credit to private businesses. Some factors influencing this reluctance are the unstable local government economic policies, the idiosyncratic country legal risk and the riskiness and opacity of business borrowers in these countries. Although there is a broad body of literature that addresses

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these issues, it either focuses on the demand side of debt (firms access to credit) or on the cross-country variation of bank lending behavior. Little effort has been devoted in explaining the within-country variation of the supply side (banks) choices in their long-term lending practices, especially in emerging economies.

In this paper, we extend the credit availability literature by examining bank-level determinants of their long-term lending to firms in an emerging market. We focus on long-term business loans since this type of external financing is crucial for private firms' investment and long-term growth. More specifically, we use recent empirical evidence from the Russian banking industry to address the following three related questions: (1) Is there substantial cross-section variation in banks' ratio of long-term business loans to assets? (2) Which types of banks (by size, ownership type, and location) exhibit the highest propensity to lend long-term? (3) What are the key bank-level determinants of their long-term lending practices in a risky banking environment? By focusing on one of the biggest emerging economies, Russia, we are able to remove the effect of legal risk and unstable government policies since all banks in our study sample are subject to the same degree of legal risk and unstable government policies.

The Russian banking industry represents an ideal laboratory for empirically addressing these questions. It is comprised of a large number of banks with diverse size, ownership, location, and performance characteristics. The country's private business sector is also characterized by a shortage of long-term bank credit. According to the Russian macro-level statistics, at the end of 2007, the share of bank credit in business firms' investment in fixed assets was only 9.4%. Our study employs a large cross-section sample of 881 Russian banks, including state, foreign, and domestic private banks in various size groups and locations. The sample is highly representative of the Russian banking industry.

In a general banking literature, a long-term loan is commonly defined as a loan with an original maturity of several years. By international standards, most business loans in this category have three to ten years maturity. In this study, we define long-term business loans as loans with at least three years to maturity, which is the longest maturity specified by the Russian accounting standards for banks. Our results reveal strikingly low levels of long-term business lending by Russian banks. On average, the sample bank allocates only about 2.5% of its assets to long-term business loans; the median value of this ratio is even lower, at a 0.5% level. About two thirds of long-term business loans are granted by a small number of large state-controlled banks. The

state-controlled Sberbank, the largest commercial bank in Central and Eastern Europe, accounts for as many as 47% of sample banks long-term business loans. At the same time, the long-term lending activity of small and medium size private domestic banks is negligible. We provide evidence that these financial intermediaries focus exclusively on providing short-term financing to firms rather than long-term.

Our main regression results reveal that a bank's propensity to lend long-term to firms, depends on its size, capitalization, and the availability of long-term liabilities as its funding source. Larger banks, better capitalized banks, and banks with better access to long-term liabilities are better able to sustain and control the credit risks associated with long-term lending in emerging markets. In addition, such banks are able to attract more creditworthy corporate borrowers who have better chances to qualify for longer loan maturities.

This study contributes to the literature on credit availability in emerging markets in at least three important ways. First, we show that there is substantial within country, cross-sectional variation in banks' business lending behavior. Second, we provide evidence that this variation is systematically explained by bank-level characteristics, such as size, capitalization, and access to long-term funds. From the practical view, these results shed light on bank-level constraints in lending by identifying the factors that systematically affect banks' willingness and ability to extend long-term credit to firms. Third, this study is the first empirical attempt to an investigation of Russian banks long-term lending behavior.

The rest of the paper is organized as follows. In section 2, we present macro-level evidence regarding bank lending in Russia and review the related literature. In section 3, we describe our methodology, variables and sample and provide the reader with the sample's descriptive statistics. In section 4 we present our univariate analysis and regression results. In section 5, the last section, we provide a summary and make our concluding remarks.

## II. Background

A. *Long-Term Business Lending in Russia: Evidence from the Macroeconomic Level.*

By the end of 2007, the cumulative assets of 1,136 Russian banks

accounted for 61.4% of the country's GDP; long term business loans accounted for 37.3% of GDP. Although these credit penetration ratios are modest by international standards, they have improved dramatically in recent years. For comparison, in 2000, the ratio of bank assets to GDP was only 32.3% while the ratio of long term business loans to GDP was only 11.6%. Given that during the same period (2000 to 2007) the Russian GDP also grew at the high annual average rate of about 6 to 7 percent, these numbers reveal the rapid expansion of the country's banking sector and its continuously increasing role in providing external financing to firms.

An in-depth analysis of the maturities of business loans reveals other important tendencies. As disclosed in the 2007 Central Bank of Russia (CBR) Development Report, the structure of business loans was as follows: 48.4% accounted for loans with less than one year maturity, 27.7% accounted for loans from one to three years maturity, and 23.9% accounted for loans with over three years maturity. The CBR classifies all loans with more than one year to maturity as long-term loans. For this study however, we classify long-term loans as loans with more than three years to maturity.

Short-term loans, as reported above represent the largest share of commercial banking loans. Given that the current accounting standards for banks in Russia do not contain a separate category for real estate loans, the aggregate level of all long-term loans to firms with more than three years to maturity appears to be very low. Simple calculations reveal that this level is equivalent to only 8.9% of the country's GDP.

The shortage of long-term bank financing is also reflected in the macroeconomic statistic for industrial firms. According to the Russian Government Statistical Agency, at the end of 2007 the share of bank credit in firms' investment in fixed assets was only 9.4%. Although it has more than doubled from 2000 (about 4.4% at that time), it remains relatively low. A direct consequence of the existing long-term credit shortage is the heavy dependence of Russian firms on internal financing or, in the case of larger firms, on foreign debt and foreign syndicated loans.

Based on our review of the local business press, the most commonly cited reasons for the shortage of long-term bank loans in Russia are the low levels of long-term liabilities in the banking system that can be used as funding sources. The low levels of of long-term liabilities increase the maturities mismatch problem and raise the liquidity risks, thus limiting banks' ability to issue long-term loans. Other potential

**TABLE 1.   Russian banks groups: Composition of sample banks and all Russian banks by ownership, size, and location (2007)**

|  | All credit institutions | | | Sample banks | | |
|---|---|---|---|---|---|---|
|  | N | % | Total assets share, % | N | % | Total assets share,% |
| Commercial banks: | | | | | | |
| State | 24 | 2.1 | 39.2 | 21 | 2.4 | 43.7 |
| Foreign | 85 | 7.5 | 17.2 | 48 | 5.5 | 14.2 |
| Large private | 147 | 12.9 | 35.5 | 141 | 16.0 | 35.1 |
| Medium and small Moscow | 382 | 33.6 | 3.9 | 268 | 30.4 | 3.2 |
| Medium and small regional | 454 | 40.0 | 3.7 | 403 | 45.7 | 3.8 |
| Nonbank credit companies | 44 | 3.9 | 0.5 | 0 | - | - |
| Total | 1,136 | 100.0 | 100.0 | 881 | 100.0 | 100.0 |

**Note:** This table reports the Central Bank of Russia classification of the types of Russian banks, the market shares of each group, and provides evidence of the representativeness of the study sample. Bank group classification replicates the Bank of Russia methodology and accounts for bank controlling owner type, size, and central location. The data for all Russian credit institutions are obtained from the CBR Development Report for Central in the year 2007. The definitions of State and Foreign banks are provided in table 2. Large private banks are privately-controlled banks with more than $306.5M of assets. Medium and small banks are privately-controlled banks with less than $306.5M of assets. Moscow medium and small banks are headquartered in Moscow; regional medium and small banks are headquartered in any geographic location outside Moscow.

explanations include low quality and low transparency of borrowers (opacity), high credit risks, weak protection of creditor rights, and low efficiency of bank-level risk management systems. While the legal and business environment are systematic risk factors, other factors such as the availability of long-term funds, the access to best corporate borrowers and the management team expertise in controlling bank credit risks are bank-level factors that may vary substantially across the Russian banking sector.

The Russian banking industry is heavily concentrated and geographically segmented. For example, in 2007, the five largest Russian banks accounted for 43.2% of the industry's assets. Therefore, the aggregated statistics on bank loans may mask important bank-level differences. According to the CBR classification, there are six major types of banks in Russia: state-controlled, foreign-controlled, large private, small and medium Moscow, small and medium regional and

nonbank credit institutions. The first five categories are classified as commercial banks. The distribution of all Russian banks across the six categories is provided in the first four columns of table 1.

As shown in table 1, in 2007, 24 state-controlled banks accounted for 39.2% of the industry's total assets. The banking system is heavily dominated by the state-controlled Sberbank (not reported in table 1), the largest bank in the Central and Eastern Europe. Sberbank is majority-controlled by the Central Bank of Russia and accounts for about one half of the total banking system deposits and about one third of the total banking system loans. Since the Russian legal system does not allow foreign branches, foreign-controlled banks are typically daughter companies of foreign banks that are registered as Russian entities. The third group, the group of large private banks, is collected from a list of 200 largest banks after the CBR excludes state and foreign banks. All other banks are classified small and medium-size banks. There are two groups of "small and medium" banks: those located in Moscow and those located in other regions. This bank classification, which we employ in our subsequent empirical analysis, reflects the high segmentation of the Russian banking sector and suggests bank-level differences in their lending behavior.

## B. Related literature

There is a wide theoretical and empirical finance literature that analyzes the importance of bank loans to non-financial firms around the world. The seminal papers of Leland and Pyle (1977), Campbell and Kracaw (1980), and Diamond (1984) discuss the uniqueness of banks as financial intermediaries and show that banks play a special role in monitoring corporate borrowers and in providing external financing to firms in situations where information asymmetries exist. Mayer (1990) presents evidence that loan financing in the period of 1970 to 1985 accounted for 24.4 percent of all financing by non-financial firms in the US. Loan financing for the same period ranged from a low of 7.6 percent (U. K.) to a high of 50.4 percent (Japan). These data highlights the importance of bank financing to corporations, even for the world's most developed financial markets. There are also a number of studies, including Petersen and Rajan (1994 and 1995), Chemmanur and Fulgieri (1994), and Bolton and Freixas (2000) that find risky firms and firms with the highest probability of becoming financially distressed chose bank loans over publicly issued debt. Based on these findings one can

infer that companies operating in the risky and inherently imperfect emerging markets will select bank loans as their chosen method of financing versus publicly issued debt or equity securities. It has been also shown that in countries where there is government intervention in their banking systems, instability and fragility of their economic systems increase (Kaufman, 2004). According to the author, once there is government intervention, banks increase their risk exposures beyond the risk levels observed in the absence of such interventions and decrease their capital ratios.

The scarcity of long-term credit availability in emerging market economies is recognized as an obstacle to their growth. Caprio and Demirguc-Kunt (1997) find that non-financial firms in such markets consider the scarcity of long-term credit as one of the most important impediments to their operations. They show that firms that grew faster than predicted, exhibited higher levels of long-term debt to total assets. The long-term credit availability is also sensitive to the level of development of a country's financial and legal institutions. If the legal environment and the enforcement of debt contracts are weak then, as Diamond (1991) maintains, banks will mitigate potential credit risks by extending short-term rather than long-term loans.

A number of empirical studies support the argument that banks use shorter loan maturities to enforce monitoring through more frequent renegotiations of loans and to mitigate informational asymmetries between the creditor and opaque or risky borrowers. Strahan (1999) finds that safer, larger, and more profitable companies receive loans with greater maturity times. Ortiz-Molena and Penas (2008) report a negative and monotonic relationship between borrower risk and maturity and show that more opaque and risky companies receive shorter maturity loans.

More recent research explores the credit availability and cross-country variation in the maturities of bank loans in the emerging markets. It reveals an important risk factor that affects the supply of credit in general and loan maturities in particular - the legal risk of debt. The legal risk of debt, as defined by Esty and Megginson (2003), depends on both the strength of creditor's rights and the enforcement of those rights in the country where the loan is originated. The authors find that the strength of creditor's rights affects non-financial firms' debt structure. Maksimovic (1999) find that in developing counties loan term maturities tend to be shorter. The importance of creditors rights protection in bank lending decisions, including the credit rationing and

the maturity of loans, is further supported by and Diamond (2004), Qian and Strahan (2007), and Bae and Goyal (2009). González and González (2008) find that higher bank concentration acts as a substitute for creditor's protection. Giannetti (2003) finds that the existence of creditor protection rights is very important in determining the availability of long term debt for companies operating in industries exhibiting high volatility of returns. De Jong, Kabir, and Nguyen, (2008) also find that the existence of creditor's rights protection in a country is an important factor in determining the capital structure of firms operating in that country and that institutions favoring creditor's rights protection and enforcement have more long term loans available. According to Claessens, Djankov and Nenova (2001) stronger creditor and shareholder rights have a strong negative impact on a company's leverage. Fan, Titman and Twite (2006) show that banks in countries with strong legal systems and creditor protection rights firms tend to exhibit lower leverage but higher long term debt to total debt ratios. Diamond (2004) maintains that in emerging markets where the financial benefits from pursuing legal enforcement are too small, creditors might engage in what is called lender passivity. Instead of relying on weakly enforced legal protection of creditor rights or on higher interest rates, a passive lender will employ non-price mechanisms, such as the maturity of loans, to effectively control credit risk in such environments.

Overall, the prior theoretical and empirical literature reveals the importance of long-term loans to emerging markets firms on one hand and the shortage of these loans on the other. It also predicts that bank loan maturities should be shorter in countries with higher legal risk and more risky or opaque corporate borrowers. At the same time, most prior studies of long-term bank financing in the emerging markets has focused either on cross-country evidence or the analysis of bank loan maturities exclusively from the borrower's perspective. Very little is known about bank-level determinants that affect long-term lending to firms. In this paper, we attempt to extend the literature on credit availability in an emerging market by focusing on bank-level determinants of long-term lending to firms. The within-country setting allows us to control for the legal and business environment and to identify which factors, besides country and borrower characteristics, are systematically related to the bank's willingness and ability to extend long-term credit to firms in a risky emerging market.

## III.  Methodology and Data

*A.  Model and variables*

To examine the relationship between bank characteristics and bank propensity to issue long-term loans to firms, we employ a large sample of Russian banks and a broad set of explanatory variables. The general form of our model is:

$$y = X\beta + \varepsilon$$

where $y$ is a $T$-vector containing $T$ observations of the dependent variable, $\beta$ is a $k + 1$ vector of regression coefficients (betas), $X$ is a $T$ x $(k + 1)$ matrix of 1's in the first column followed by the explanatory variables and  is a $T$-vector of disturbances. $T$ represents the number of observations (881) and $k$ is the number of independent variables (9). Table 2 provides the definitions of the analysis variables. To mitigate the effects of extreme outliers, all constructed financial ratios are winsorized at the one percent level in both tails of the distribution.

Our major dependent variable is the ratio of bank long-term business loans to total assets. Our supplementary dependent variable is the bank overall business lending activity, measured as the ratio of bank business loans to total assets. Business loans in this study are defined as loans to private non-financial firms. Long-term business loans are loans with over three years to maturity. To construct ratios, we scale both loans categories by total bank assets.

To explain the bank-level cross-sectional variability in long-term business loans ratio, we select our explanatory variables by relying upon the general existing literature on bank lending behavior. More specifically, we account for bank size, capitalization, liabilities structure, risk-taking, ownership type, managerial expertise, and location. Bank size is measured as the logarithm of bank assets. Larger banks are more diversified, have larger pools of funds available, have access to larger and more creditworthy corporate borrowers, and have more resources for the development of advanced credit risk management and evaluation systems. Therefore, we expect a positive relation between bank size and the ratio of long-term loans.

Bank capitalization is measured by the book equity to assets ratio. Bank capitalization can affect bank willingness and ability to extend long-term loans in several different ways. Banks with larger capital cushion against credit risks should have higher capacity to extend risky, long-term loans. In addition, better capitalized banks can attract more

**TABLE 2.   Definition of regression variables**

| Variable | Definition |
| --- | --- |
| Total business loans (TBL) | The ratio of bank' loans to nonfinancial private firms divided by assets, expressed as a percentage. |
| Long-term business loans (LTBL) | The ratio of bank' loans to nonfinancial private firms with over three years maturity divided by assets, expressed as a percentage. |
| Size | Log (Bank assets in Rubles thousands). |
| Capital | The ratio of book equity to assets, expressed as a percentage. |
| Long-term liabilities (LT Liab.) | The ratio of bank' liabilities with over three years maturity divided by total liabilities, expressed as a percentage. |
| PLL | Provision for business loan losses as a percentage of total business loans. |
| State | = 1 if a bank is majority-controlled by any combination of government authorities or state-owned companies/enterprises and zero otherwise. |
| Foreign | = 1 if a bank is majority-controlled by a foreign investor zero otherwise. |
| Moscow | = 1 if a bank is headquartered in Moscow and zero otherwise. |
| General | = 1 if a bank has a General license and zero if a bank has a restricted license. |

creditworthy borrowers that will qualify for longer term loans. Alternatively, high levels of capital can reveal risk averse and conservatively managed banks that may be reluctant to issue risky long-term loans. Therefore, we cannot predict a sign on the capital ratio.

To capture the potential mismatch between liabilities and loans maturities that can also affect the bank ability to lend long-term, we account for the bank reliance on long-term financing, measured as the ratio of liabilities with over three years to maturity to total liabilities. We expect that banks with better access to long-term financing should be better able to issue long-term loans. We use the provision for business loan losses to total business loans (PLL), as a measure of the quality of bank business loans portfolio. PLL is an accounting value that represents an amount of money set aside for recovering possible losses

due to existing bad loans and loans with high probability of default. In general, the riskier the bank lending practices are the higher their PLL ratio should be.[1]

Bank ownership type is captured by the two dummy variables that indicate state-controlled and foreign-controlled banks. State-controlled banks can allocate long-term credit to promote economic growth and to address the shortage of long-term financing found in the Russian banking sector. If this is the case and state banks indeed fulfill the social welfare agenda, there should be a positive and significant relation between the state-controlled dummy and the ratio of long-term loans, after controlling for all other potential explanatory variables in the regression analysis. Foreign-controlled banks may also pay a distinct role in allocating long-term loans in an emerging market. In particular, they may have comparative advantages in issuing long-term loans due to better risk management and/or their ability to "cherry pick" low risk borrowers (Bhaumik and Piesse, 2008). In the inherently risky emerging markets, foreign banks also tend to establish relations with more transparent corporate borrowers.

The general license dummy proxies bank qualitative characteristics. We expect that banks with the most advanced banking license in Russia, the general license, will be better experts in sorting out creditworthy borrowers and, therefore, may be better equipped to lend long-term in a risky environment. Finally, following the CBR classification, we distinguish Moscow banks versus all other Russian banks as Moscow banks operate in the most competitive environment.

## B.  *Sample and descriptive statistics*

By the end of 2007, 961 Russian credit institutions publicly disclosed

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1. The methods of assigning PLL vary substantially across countries. In several developed countries, including US, regulators allow banks to rely on the bank management estimation of the loan portfolio credit risk. In this context, the PLL ratio is difficult to interpret as it reflects not only the quality of loan portfolio but also bank management risk aversion. In the case of Russia, however, bank managers have very limited discretion in allocating PLL. The Central Bank of Russia imposes strict and detailed rules on the allocation of provisions for loan losses which are based on the quality of each loan in the business loans portfolio (CBR Regulation No. 254-P, with amendments). Therefore, by construction, the PLL accounts for the risk associated with all problematic loans, including those that have not been officially recognized as overdue yet. Furthermore, while a Russian bank can manipulate the size of the overdue loans by restructuring the problematic ones such manipulation does not affect the size of PLL. For all these reasons, we are convinced that the PLL ratio is a more reliable measure of Russian banks credit risks than the ratio of overdue loans.

their detailed financial statements. After eliminating non-bank credit companies, banks with inactive licenses, and banks with less than 5% of assets in business loans, we end up with a sample of 881 banks. This final sample is highly representative of the Russian banking industry since it represents 81% of all Russian commercial banks and accounts for 93% of the total banking system assets.

Financial data are obtained from the 2007 year-end bank financial statements disclosed through the CBR website. Nonfinancial banks characteristics, such as license type and geographical location, come from the CBR bulletin of banking statistics. To distinguish state-controlled, privately-controlled, and foreign-controlled banks, we use bank equity accounts and a 50% control threshold. In accordance with Russian accounting standards, banks disclose equity shares of the government authorities, government-owned enterprises, and foreign investors in their balance sheet.[2]

Table 1 presents the distribution of bank types in the study sample and in the overall banking system. As described in Data section, the CBR categorizes Russian banks into the following six groups: (1) state-controlled banks; (2) foreign-controlled banks; (3) large private banks; (4) medium and small Moscow banks; (5) medium and small regional banks; (6) nonbank credit companies. Non-bank credit companies are licensed for only a limited range of operations and as such, they are excluded from our analysis. Large private banks are defined as privately-controlled banks with at least $306.5M of total assets. This threshold is used to identify the 200 largest banks in Russia. All banks in categories (3) to (5) are privately-controlled. The regulator distinguishes bank location by placing Moscow banks in a separate category to account for the fact that small and medium Moscow banks operate in a highly competitive environment. This location classification enables us to examine the lending tendencies and patterns of small and medium banks when they operate in a competitive environment rather than in a regional, non-competitive one.

Overall, the frequencies in table 1 reveal that the study sample is highly representative of the Russian banking sector. Although the state-controlled banks are few, they account for 39.2% of the total system assets and for 43.7% of the sample assets. Foreign-controlled banks represent 5.5% of sample banks and 14.2% of sample assets.

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2. The year 2007 is the last year in which Russian banks disclosed equity shares composition by the owner type. The revised accounting standards eliminated this requirement.

**TABLE 3.  Descriptive statistics of bank financial characteristics (881 Russian banks, 2007)**

|  | Mean | SD | Min | 10th percentile | 25th percentile | Median | 75th percentile | 90th percentile | Max |
|---|---|---|---|---|---|---|---|---|---|
| TBL | 37.13 | 17.09 | 5.03 | 14.00 | 23.88 | 37.30 | 49.56 | 60.12 | 75.58 |
| LTBL | 2.44 | 4.42 | 0.00 | 0.00 | 0.00 | 0.49 | 3.10 | 7.38 | 26.53 |
| Size | 14.64 | 1.74 | 7.93 | 12.63 | 13.55 | 14.48 | 15.59 | 16.81 | 22.36 |
| Capital | 16.24 | 11.92 | 3.20 | 6.25 | 8.67 | 12.32 | 19.51 | 31.59 | 65.46 |
| LT Liab. | 4.87 | 7.47 | 0.00 | 0.00 | 0.00 | 1.99 | 6.53 | 12.95 | 40.49 |
| PLL | 4.84 | 6.18 | 0.00 | 0.53 | 1.06 | 2.46 | 6.04 | 12.94 | 35.00 |

**Note:**  The definitions of all variables are provided in table 2. The descriptive statistics of all regression non-dummy variables are provided along with their 10th, 25th 50th (median), 75th, and 90th percentiles. Total Business Loans are denoted as TBL, Long Term Business Loans are LTBL, and Long Term Liabilities are LT Liab.

Large private banks account for 16.0% of the sample banks and 35.1% of the sample assets. Finally, the two large groups of small and medium sized banks (regional and located in Moscow) represent 76.1% of sample (in numbers) but they account for only 7.0% of the sample's total assets.

Table 3 presents the summary statistics for the sample banks financial variables. Size is expressed as the natural logarithm of thousands of rubles and has a mean of 14.64 and a median of 14.48. The size of sample banks ranges from less than 3 million rubles (or about $100K), a dwarf commercial bank named Kontinental and located in the Republic of Dagestan, to 5,120 billion rubles (or about $200B), the largest Russian bank, Sberbank.  The average capital ratio in our sample is 16.24%. The ratio of long-term liabilities to total liabilities is low with a mean value of 4.87%, a median value of only 1.99%, and a wide range from 0 to 40.49%. Moreover, at least 25% of the sample banks have zero long term liabilities indicating a shortage of funds available for long term lending. The PLL ratio ranges from a minimum of zero to a high of 35% with a mean of 4.84% and a median of 2.46%.

As reported in table 3, the average bank in our sample of 881 banks allocates 37.13% of assets in business loans. The ratio of long-term business loans to assets ranges widely between 0% and 26.53%, with a mean of 2.44% and a median of only 0.49%. This evidence suggests that Russian business loans are heavily dominated by short-term maturities. In other words, banks are engaged in liquidity provision rather than disbursement of long-term credit to firms. The descriptive statistics for the long-term loans ratio provides a strikingly low estimation of the median sample bank's engagement in the long-term lending to firms. Notably, this ratio is well below the indicators reported for the macro banking statistics and, therefore, the overall results for the Russian banking system are driven by a few large banks. We explore this possibility in more details in the Results section.


## IV.  Results

### A.  Who Lends Long-Term? Bank Group Univariate Comparison.

We start the investigation of the relationship between Russian banks characteristics and long-term lending activity with a series of simple univariate comparisons. More specifically, we explore the differences

in bank lending behavior among the five bank groups as classified by CBR and among groups of banks of different sizes. Using these two alternative bank group classifications we try to answer two questions: 1) which types of Russian banks are responsible for the disbursement of long-term credit to firms, and 2) are a few large banks responsible for the bulk of long-term business loans in the Russian economy. For comparison, we also analyze the overall business lending activity by examining the ratio of total business loans to assets.

Table 4 presents descriptive statistics for the total and long-term lending to firms in state-controlled, foreign-controlled, large private, small and medium size Moscow, and small and medium size regional banks. In the case of total business loans to assets ratio, the differences among bank groups seem to be relatively small. Large private banks exhibit the highest lending activity, 41.31%, expressed as the ratio of total business loans to assets (the median is 42.20%). State-controlled banks exhibit the lowest average lending activity (33.63% of assets). The lending behavior of medium and small Moscow banks follows the lending behavior of state-controlled banks with their average total business loans to assets ratio being 33.79%. In terms of the group shares, however, the story is different.[3] Although state-controlled banks are, on average, not the most active in the business lending segment, the overall share of business loans originated by these banks is 47.45%. This result confirms the evidence provided in table 1: A relatively small number of state-controlled banks accounts for a disproportionally large share of the banking sector lending to businesses in Russia.

Table 4 also presents descriptive statistics for long-term business lending across bank groups. The cumulative role of state-controlled banks is pronounced: collectively, they account for 65.99% of sample business loans with over three years to maturity.[4] As our sample is highly representative for the Russian banking system, the market share of state banks in the industry should have a comparable magnitude. On a bank level, foreign-controlled banks and state-controlled banks exhibit the highest mean ratios of long-term loans to their assets: 5.71% and 4.76%, respectively. The role of small and medium size banks in long-term lending is negligible. These banks tend to have less than 2% of long-term business loans in their assets and their cumulative market share is only 1.53%.

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3. Group share percentages are not reported on the table.

4. Not reported on the table

**TABLE 4. Business lending behavior across bank groups**

Pair wise comparisons between bank groups:
Total and long-term (LT) business loans to assets ratios,
p-values for t-tests
(p-values for z-tests)

| Bank groups | | Descriptive statistics | | Foreign | | Large private | | Medium and small Moscow | | Medium and small regional | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Group share in total sample % | Mean (Median) % | TBL, t-test (z-test) | LTBL, t-test (z-test) | TBL, t-test (z-test) | LTBL, t-test (z-test) | TBL, t-test (z-test) | LTBL, t-test (z-test) | TBL, t-test (z-test) | LTBL, t-test (z-test) |
| State (N = 21) | TBL | 47.50 | 33.63 (35.29) | 0.353 (0.404) | | 0.021 (0.023) | | 0.902 (0.907) | | 0.160 (0.280) | |
| | LTBL | 66.09 | 4.76 (1.41) | | 0.603 (0.350) | | 0.635 (0.477) | | 0.050 (0.000) | | 0.084 (0.012) |
| Foreign (N = 48) | TBL | 12.79 | 37.26 (38.43) | | | 0.176 (0.202) | | 0.255 (0.223) | | 0.800 (0.829) | |
| | LTBL | 12.74 | 5.71 (3.48) | | | | 0.109 (0.439) | | 0.000 (0.000) | | 0.001 (0.000) |
| Large private (N = 141) | TBL | 33.61 | 41.17 (42.20) | | | | | 0.000 (0.000) | | 0.027 (0.044) | |
| | LTBL | 19.49 | 4.00 (3.06) | | | | | | 0.000 (0.000) | | 0.000 (0.000) |
| Medium and small Moscow (N = 268) | TBL | 2.65 | 34.01 (32.05) | | | | | | | 0.005 (0.004) | |
| | LTBL | 0.77 | 1.56 (0.00) | | | | | | | | 0.186 (0.000) |

( *Continued* )

**TABLE 4.** **(Continued)**

Pair wise comparisons between bank groups:
Total and long-term (LT) business loans to assets ratios,
*p*-values for t-tests
( *p*-values for *z*-tests )

| Bank groups | | Descriptive statistics | | Foreign | | Large private | | Medium and small Moscow | | Medium and mall regional | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Group share in total sample % | Mean (Median) % | TBL, t-test (z-test) | LTBL, t-test (z-test) | TBL, t-test (z-test) | LTBL, t-test (z-test) | TBL, t-test (z-test) | LTBL, t-test (z-test) | TBL, t-test (z-test) | LTBL, t-test (z-test) |
| Medium and small regional (N = 403) | TBL | 3.45 | 37.96 (37.93) | | | | | | | | |
| | LTBL | 0.86 | 1.97 (0.42) | | | | | | | | |
| Total sample (N = 881) | TBL | 100.00 | 37.13 (37.30) | | | | | | | | |
| | LTBL | 100.00 | 2.44 (0.49) | | | | | | | | |

**Note:** This table presents descriptive statistics for business loans ratios across five bank groups. Bank groups are determined according to the Central Bank of Russia classification. The definitions of State and Foreign banks are provided in table 2. Large private banks are privately-controlled banks in the top 200 size rank. Medium and small banks are privately-controlled banks below 200 size rank. Moscow medium and small banks are headquartered in Moscow; regional medium and small banks are headquartered in any geographic location outside Moscow.

Overall, pair-wise comparisons reported in table 4 show that state, foreign and large private banks exhibit higher long term business loans than medium and small banks. Large private banks also exhibit higher both total business loan ratios than those of medium and small banks. In addition state banks exhibit lower total business loan ratios than large private banks. There are no other significant differences however between state, foreign and large private banks. Medium and small regional banks exhibit higher total business ratios than medium and small located in Moscow but only the median is statistically significantly different for the long term business loans ratio.

The empirical evidence (not reported in the table) also reveals high concentration in the Russian long-term business lending market. The largest Russian bank, state-controlled Sberbank, accounts for as many as 47.01% of long-term business loans in the sample with a high ratio of 18% of long-term loans to assets. The 10 largest banks in our sample, including Sberbank, account for as many as 77.43% of long-term loans. The median ratio of long-term loans to assets for the 661 smaller banks (banks below 200 size rank) is only 0.08%. Collectively, these small banks account for only 1.39% of sample long-term loans. The above statistics provide strong evidence that long-term lending to firms in Russia is extended predominantly by few large banks. Although small banks are relatively active in lending to businesses, they are reluctant to provide long-term loans and focus almost exclusively on providing short-term loans, i.e. liquidity, to the borrowing firms. Our evidence also clarifies the discrepancy we observe between the macro-level and the bank-level statistics: the aggregate level data, presented in the CBR reports, describe the lending patterns of Sberbank and a few of the largest banks. These few, large banks provide the bulk of long-term lending while the rest of the banks exhibit very low activity in long-term lending.

Overall, the results in table 4 present preliminary evidence on bank-level differences regarding Russian banks long-term lending to firms. The descriptive statistics suggest that bank ownership and bank size are important determinants of the long-term business lending by banks. The evidence in table 4 however is based on simple comparisons of means, medians, and sample shares. It does not capture possible correlations between ownership, size, and other factors that can affect bank lending strategies, such as bank capitalization, access to long-term liabilities, license type, and the quality of the business loans portfolio. To address this gap, we perform multivariate regression analysis that explicitly controls for these differences and we present the results and

their analysis in the next section.

## B.  Regression Results

As described in Section III, *A*, we distinguish between the total business lending activity of banks (all maturities) and long-term business lending by employing two alternative dependent variables: (1) the ratio of business loans to assets and (2) the ratio of long-term business loans to assets. The explanatory variables are identical in both models and account for bank size, capitalization, and reliance on long-term liabilities, PLL, ownership type, and license type. Our OLS regression specification also includes the interaction term, Moscow × Size, to account for size variability among banks headquartered in Moscow. This interaction terms replicates the CBR bank classification approach that classifies Moscow, small and medium size banks into a separate category.[5]

The estimation results are presented in table 5. To ensure the robustness of our results, in addition to the OLS regressions[6] we also run regressions tests using Huber's Robust M estimators (hereafter HRM).[7] In the first model, the coefficients on bank size and capital-to-assets ratio are both positive and statistically significant at the 1 percent level for all three regressions. This finding indicates that larger (and likely more diversified) banks and well-capitalized banks are better able to withstand potential credit risks and, therefore, allocate higher percentage of their assets to business loans. The regression results for the first model also suggest two marginally significant (at a 10% level) associations: banks with more long-term liabilities are marginally more willing to lend to businesses, while state-controlled banks are marginally less likely to lend to businesses. Although the HRM regression estimated coefficients for General license and Moscow

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5.  An examination of the correlation coefficients shows that there is no multicollinearity present among our independent variables. The highest (in absolute value) correlation coefficient is –0.43, observed between the capital ratio and bank size. The second largest correlation coefficient is only 0.26 and exists between bank size and long-term liabilities ratio.

6.  The OLS estimation in table 5 employs financial data that is winsorized at the 1st and 99th percentiles.

7.  For the methodology see Huber, P. J. Robust Statistics. Wiley, John & Sons, Inc., New York (1981).

**TABLE 5.   OLS regressions Results**

| | Dependent Variable: Total business loans as % of assets (1) | | Dependent Variable: Long-term business loans as % of assets (2) | |
|---|---|---|---|---|
| | OLS (wins.) Coefficient Estimate (*t*-Statistic) | HRM Coefficient Estimate (*t*-Statistic) | OLS (wins.) Coefficient Estimate (*t*-Statistic) | HRM Coefficient Estimate (*t*-Statistic) |
| Size | 3.004 | 3.362 | 0.628 | 0.446 |
| | (5.23)*** | (5.74)*** | (5.27)*** | (6.15)*** |
| Capital | 0.269 | 0.290 | 0.052 | 0.018 |
| | (4.25)*** | (5.30)*** | (3.06)*** | (2.65)** |
| Long-term liabilities | 0.165 | 0.183 | 0.164 | 0.072 |
| | (1.84)* | (2.59)** | (4.48)*** | (8.19)*** |
| PLL | 0.137 | 0.115 | 0.096 | 0.029 |
| | (1.37) | (1.24) | (2.75)*** | (2.53)** |
| State | −7.670 | −8.109 | 0.788 | 0.392 |
| | (−2.43)* | (−2.05)* | (0.88) | (0.80) |
| Foreign | −3.558 | −3.384 | 1.418 | 0.957 |
| | (−1.18) | (−1.23) | (1.81)* | (2.82)*** |
| Moscow | −3.673 | 2.439 | −3.106 | −5.309 |
| | (−1.11) | (0.23) | (−4.06)*** | (−4.05)*** |
| Moscow x Size | −0.467 | −0.582 | 0.453 | 0.317 |
| | (−0.71) | (−0.81) | (2.85)*** | (3.57)*** |
| General | −0.790 | 1.213 | −0.036 | 0.342 |
| | (−0.51) | (0.78) | (−0.09) | (1.77) |
| Constant | −9.403 | −14.956 | −8.581 | −5.732 |
| | (−1.11) | (−1.75) | (−4.97)*** | (−5.42)*** |
| N | 881 | 881 | 881 | 881 |
| Adjusted $R^2$, % | 7.76 | – | 24.59 | – |
| *F*-statistic | 8.09 | – | 20.80 | – |

   **Note:**  The table reports the estimated coefficients and associated *t*-statistics of OLS estimations for the winsorized data and Huber's Robust M estimators (HRM) for the unwinsorized data.  For the HRM estimation, the critical value c=1.345. Data includes a cross-section of 881 Russian commercial banks as of the end of 2007. The definition of variables is provided in table 2.  ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

location variables exhibit the opposite sign than those estimated using OLS, both coefficients under both methodologies are statistically insignificant in explaining the total business loans ratios of banks.

     The main results of our study are presented in the second regression where the dependent variable is the ratio of long-term business loans to

total assets. Similar to our prior findings, bank size and capitalization continue to play an important role in determining the bank's willingness and ability to lend to businesses long term. The coefficients on these two explanatory variables remain positive and highly statistically significant, indicating that larger banks and better capitalized banks tend to extend more long-term credit to firms than smaller and less capitalized banks. As expected, long-term liabilities become even more significant in determining the bank's propensity to lend long-term to businesses than to simply lend to businesses.

Interestingly, the multivariate results in table 5 reveal that once we control for bank-level financial characteristics, the bank ownership effect in long-term lending which was detected in our univariate analysis, either becomes weak (in the case of foreign banks) or completely disappears (in the case of state banks). The HRM estimated coefficient of foreign banks, however, is positive and highly significant clearly indicating that foreign banks tend to exhibit higher long term loan ratios. Although state-controlled and foreign-controlled banks appear to have higher than average involvement in long-term lending in Russia, their involvement is explained by their larger size and /or better access to long-term stable funding in the form of long-term liabilities and capital.

Since state banks account for almost two thirds of long-term business loans (see table 4), it can be argued that a few largest state-controlled banks, including the monopolistic Sberbank, account for the bulk of these loans. In the case of foreign-controlled banks, the coefficient on foreign bank dummy is positive but only marginally significant, at 10% level according to the OLS estimation but highly significant according to the HRM estimation. One possible explanation is that foreign banks are able to "cherry pick" more transparent and creditworthy borrowers and, therefore, may be relatively more willing to extend longer term loans. We also find strong empirical support that small banks headquartered in Moscow are reluctant to provide long-term business loans. Interestingly, the small Moscow banks effect is not detected in the first model, suggesting that smaller banks in this competitive location do perform some business lending to firms but focus on providing shorter-term loans.

Surprisingly, banks with larger provision for loan losses also exhibit higher ratios of long-term loans to assets. One plausible explanation for this result is that the PLL ratio is endogenous: banks with higher ratio of long-term loans have overall riskier loan portfolios and need to

allocate more reserves for potential losses. Since our data are cross-sectional, we cannot empirically address this possibility. Finally, contrary to our expectations, we do not find any significant relation between a bank's license type and its long-term loans ratio. In addition, the OLS estimation and the HRM coefficient estimation produce coefficients with opposite signs but both are statistically insignificant.

In summary, bank size and capital are the most important and consistent factors in determining a bank's propensity not only to lend to businesses but to lend long term. While long-term liabilities and provisions for loan losses are not important for determining a bank's propensity to lend to business, they become very important in determining a bank's long-term lending behavior. Finally, while our explanatory variables explain 7.76 percent of the variation we observe in business loans, their explanatory power increases to 24.59 percent in explaining the variation in long-term business loans.

## V.  Summary and Conclusions

This study examines the determinants of bank long-term lending to businesses in the emerging market context. By examining bank-level data in a single country setting, we are able control for the legal and business environment characteristics and to provide robust empirical evidence on the determinants of the bank's propensity to extend long-term business loans in a risky emerging market.

Using a large and representative sample of Russian banks in 2007, we provide strong evidence on the banks reluctance to provide business loans with more than three years maturity. The multivariate test of cross-sectional differences in the bank lending decisions reveals that smaller banks, less capitalized banks, banks with low levels of long term funding sources, banks with lower cushion against potential loan losses, and banks in competitive Moscow area are more averse to lend long term.

From the broader perspective, these results confirm that in addition to the well-known country-level obstacles to long-term financing in emerging markets, such as weak creditor rights protection and enforcement and low creditworthiness of risky borrowers, there are significant bank-level constraints in providing long-term loans to firms, including insufficient bank size, low capitalization, and lack of long-term liabilities From the practical view, these results identify

specific bank-level constraints that systematically affect bank willingness and ability to extend long-term credit to firms.

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