

**DETERMINANTS OF BANK INTEREST MARGINS IN RUSSIA:
DOES BANK OWNERSHIP MATTER?**

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Abstract

This paper analyzes bank interest margin determinants in Russia, with particular emphasis on the bank ownership structure. Using a unique dataset covering the whole banking sector in Russia for the 1999-2007 period we find evidence that bank ownership matters in terms of interest margin determinants. The impact of some of the commonly used determinants, including bank risk aversion, credit risk and size of operations differs across state-controlled, domestic private and foreign-owned banks. On the other hand, the influence of market concentration, operational costs and liquidity is homogeneous across ownership groups. Our findings emphasize the importance of bank ownership for evaluating the impact of interest margin determinants.

JEL classification: G21, P34

Keywords: bank net interest margin, financial intermediation, Russia

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1. Introduction

The importance of banking sector development for economic growth cannot be undermined. This holds true especially in transition countries where financial system started to develop from the scratch after the fall of the centrally-planned system and financial markets still fall behind the developments in the banking sector (Berglof and Bolton, 2002). Russia represents an interesting example of such a transition country. Its banking sector has been growing very fast after the recovery from the 1998 crisis. This growth contributed to an increasing importance of banks in the process of financial intermediation. The ratio of banking sector assets to GDP has almost doubled since the year 2000 and it exceeded 60% at the end of 2007 (CBR, 2008). Bank credit to private sector as a proportion of GDP has exhibited a similar pattern during this period.

This expansionary trend of bank participation in the reallocation of financial resources raises a question of how costly the intermediation services offered by banks are. Moreover, in Russia, where the state still plays an important role in the banking sector and foreign ownership is modest, related to this is a question of how bank ownership structure affects the costs of financial intermediation. To address these questions, we analyze bank net interest margin – a commonly used measure of efficiency of financial intermediation – and its determinants. General trends suggest that financial intermediation by banks in Russia has increased significantly in recent years. We investigate if the efficiency of financial intermediation process differs when bank ownership is taken into account.

In general, the analysis of interest margins and interpretation of their level contains a trade-off. On the one hand, high margins create impediments for the deepening of financial intermediation in the country, as lower deposit rates are discouraging savings in terms of bank deposits, and high loan rates are reducing the investment opportunities of banks. In emerging

economies where capital markets are still underdeveloped and most of the firms and individuals rely on bank loans, this may even hinder growth (Martinez Peria and Mody, 2004). Moreover, high margins may indicate problems in the regulatory banking environment and information asymmetry (Claeys and Vander Venet, 2007). On the other hand, higher margins can improve profitability of the banking system, strengthen bank capitalization and solidify its financial position by creating additional buffers against negative shocks (Barajas et al., 2000).

In this paper, we test the importance of bank interest margin determinants suggested by a theoretical model for the Russian case. The sample is subdivided into three parts according to the bank ownership structure. To this end, we differentiate between three types of banks – state-controlled, domestic private and foreign. Subdividing the sample according to the bank ownership structure allows us examine how the magnitude of interest margin determinants varies across different ownership structures. Even though Russia has been included in some of the cross-country bank interest margin studies, it has not been investigated separately taking the specific ownership structure of its banking sector into account. In addition, previous studies were carried out using a restricted sample of Russian banks¹, while we utilize a rich dataset covering the whole banking sector in Russia. Our findings lend support for the hypothesis that the impact of certain interest margin determinants differs by bank ownership.

The remainder of the paper is structured as follows. The next section reviews selected literature. Section 3 describes data, specification of the empirical model and methodology. Section 4 provides estimation results. The last section concludes.

¹ A standard source of data in these studies is the Bankscope database of Bureau van Dijk, which covers only a selected number of banks in each country.

2. Bank interest margin determinants: Overview of the related literature

Contemporary models employed in the literature for the analysis of interest margin determinants are based on the dealership model proposed in Ho and Saunders (1981). According to this model, banks are assumed to be risk-averse intermediators in the financial market collecting deposits and granting loans. One of the factors influencing the size of the bank margin in this model is transaction uncertainty due to asymmetric arrival time of the supply of deposits and demand for loans. Another factor driving the optimal margin set by the bank is the market structure, since the bank facing relatively inelastic demand for loans and supply of deposits is able to exercise market power and set greater margin.

The main criticism of the initial model proposed by Ho and Saunders is its failure to recognise the bank as a firm having a certain production function associated with provision of the intermediation services (Lerner, 1981). The presence of cost inefficiencies across banks associated with the production process can have a distortionary effect on the margin. Another unrealistic assumption inherent to this model is the presence of a homogenous bank assets and liabilities. Extension of the basic model to allow for a portfolio of different types of assets and liabilities implies that the cross elasticities between bank products will result in a portfolio diversification effect – the ability of banks to manipulate margins for different products to diversity risks (Allen, 1988).

The most recent extension of the basic dealership model is provided by Maudos and Guevara (2004). Their model explicitly incorporates the role of the operating costs and provides more detailed description of the link between the riskiness and the margin. More specifically, this model differentiates between market risk and credit risk, as well as their interaction as separate constituents of the margin.

Although the theoretical developments of the model were quite straightforward, its empirical verification contains several challenges. To begin with, the data available to the researchers usually describes banks located in different countries with different institutional and environmental characteristics, which complicates the comparison of the impact of various determinants across countries. For instance, factors like financial taxation (level of reserve requirements), opportunity costs for reserves, bank capitalization, fragmentation of the market varies to a great extent even within EU member countries, which have undertaken several steps towards harmonization of their regulation, legal and institutional systems (see Ruthenberg and Elias, 1996). In response to that, some empirical studies undertook a two-stage approach by isolating the impact of various imperfections not taken into account in the theoretical model in the first stage and modelling the remaining “pure spread” as a function of the theoretically motivated factors (see for instance Saunders and Schumacher, 2000).

Another difficulty associated with the empirical verification of the theoretical model is related to the data quality, which is far from being perfect especially in the case of developing economies. For example, accounting standards for classifying bad loans and measuring bank capital adequacy ratios are not consistent across countries. Related to that, the model assumes the existence of a well-functioning and efficient financial market, as well as bank managers motivated to maximize the payoff of bank shareholders. These assumptions, while being quite realistic for many developed economies, are far from reality in most of the developing economies. Therefore, it is not surprising that the empirical findings coming out of the direct implementation of this model for analysing interest margins in countries with different degrees of development (either individually, or in a panel setup) produced mixed results.

Empirical studies of interest rate margin determinants applied to the developed countries in general support the theoretical predictions of the model. The margins were found to be posi-

tively related to the degree of market concentration in the European banking sector (Saunders and Schumacher, 2000; Maudos and Guevara, 2004), in the USA (Angbazo, 1997) and in Australia (McShane and Sharpe, 1995; Williams, 2007). Another common consensus in this literature is the positive impact of operational costs banks are facing, which suggests that the technological regime of the bank plays important role in its pricing strategy. However, there are also some contradictory results reported. For example, Williams (2007) finds a negative relationship between credit risk and interest margin in Australia and interpret this finding by arguing that banks are mispricing the credit risk.

The empirical outcomes of applications in developing countries are more controversial. As it was emphasized by Brock and Rojas Suarez (2000), one should be careful in directly applying the methods developed for industrialized countries to study interest margins in developing countries. More specifically, the results can be misleading when applied to the countries with non-liberalized financial markets. Therefore, in a worldwide study of bank interest margin determinants, Demirguc-Kunt and Huizinga (2000) and Claessens et al. (2001) go beyond the framework of the dealership model. Using data on banks from 80 countries for 1988-1995, they include in their empirical specification a wide range of potential factors driving international differences in bank interest margins, including macroeconomic conditions, explicit and implicit bank taxation, deposit insurance regulation, overall financial structure, legal and institutional indicators.

In general, empirical evidence suggests that the level of interest rate margins in developing economies is persistently larger than the one in developed economies. Using data on CEE banks where Russia is also included, Claeys and Vander Venet (2007) attribute these differences to a low efficiency and low degree of market competition in these countries. In this respect, Barajas et al. (2000) emphasize the role of financial liberalization in improving the

market competition, improving banking sector efficiency and ultimately reducing interest margins and deepening financial intermediation in Colombia.

Another important factor that plays a crucial role in determining the size of the interest margin in developing countries is the presence of foreign banks. Demirguc-Kunt and Huizinga (2000) find that foreign banks realize higher margins than domestic banks in developing countries. The opposite conclusion holds for the developed countries, in which domestic banks realize higher interest margin. In a follow-up study, Claessens et al. (2001) investigate the impact of foreign bank entry (change in foreign bank presence) on the performance of domestic banks using a similar worldwide sample. They find that foreign bank entry improves domestic bank profitability, which they attribute to the banking efficiency improvement following the foreign entry. Martinez Peria and Mody (2004) show that foreign banks in Latin American countries exhibit lower interest rate margins than domestic banks. The negative impact of foreign bank presence on the margin works also indirectly through the impact on administrative costs. Similar evidence is reported in Drakos (2003) for Central and Eastern European countries, however Russia is not included in this study. In contrast to this, Dabla-Norris and Floerke-meier (2007) fail to find a direct relationship between the presence of foreign banks and interest rate margin in Armenia, while Schwaiger and Liebeg (2008) using a sample of 11 CEE countries show that foreign banks are actually charging higher interest margins than domestic banks.

Acknowledging the problems associated with measuring bank interest margin, some studies employ “narrow” and “wide” definitions of interest margin (Brock and Rojas Suarez, 2000; Dabla-Norris and Floerkemeier, 2007; Hesse, 2007). The “narrow” definition is based on the margin using only loans and deposits rates, while “wide” definition also captures the impact of other activities of banks (securities, bank services etc.). Surprisingly, the impact of the in-

terest margin determinants varies across the definitions of the margins. For example, Dabla-Norris and Floerkemeier (2007) found that capital adequacy ratio has a non-significant impact on the narrow margin (ex-post weighted spread between loan and deposit rates), while the impact on the wider margin is significantly negative. The last finding contradicts the theoretical prediction, according to which there should be a positive relationship between capital adequacy and the margin, since keeping higher capital is costly for a bank and these costs are normally transmitted to bank clients in the form of larger margin.

The above discussion suggests that especially in the case of emerging markets the determinants of bank interest margins and their impact vary a lot and bank ownership seems to play an important role. We study the case of Russia, which to the best of our knowledge, has not been separately investigated so far.

3. Methodology and data

3.1 Methodology

We use fixed effects estimator to evaluate the impact of various determinants on bank interest margins in Russian banks with different ownership structure. The fixed effect estimator was found to be superior to the pooled OLS, due to its ability to capture the heterogeneity of individual banks in Russia. The Hausman test gives preference to the fixed effect estimator when compared to another panel estimator – the random effect model. Our empirical specification takes the following form:

$$NIM_{it} = \alpha_i + \beta_1 * DET_{it} + \beta_2 * D_{SEAS} + \beta_3 * D_{TIME} + \varepsilon_{it}$$

where indices i and t stand for bank and quarter, respectively, NIM_{it} is the net interest margin for bank i in period t , α_i is the fixed effects intercept and ε_{it} is the i.i.d. error term. The sea-

sonal and time-specific variation in the interest margin is captured by the dummy variables D_{SEAS} and D_{TIME} , respectively. We opted to exclude the macroeconomic variables from our empirical specification, given the single-country nature of our sample, in which the impact of macroeconomic variables is captured by time dummy variables.

Vector DET_{it} contains six determinants of bank interest margins that are motivated by the dealership model and are also in line with the previous empirical literature investigating determinants of bank interest margins. $HERF$ is the Herfindahl index capturing the market structure in the Russian banking industry. The index is calculated for all regions in Russia, banks are allocated to the regions based on their headquarters. Herfindahl index is defined as the sum of squares of individual bank asset shares. Higher market concentration is expected to contribute to higher margins and thus the estimated coefficient in our model should have positive sign. PER is the ratio of personal expenses to total assets. This measure is capturing the impact of operational costs on the margin. Banks incurring higher operational costs tend to transfer these costs to their customers by increasing their margins and therefore the estimated coefficient is expected to be positive. CAP is the measure of bank risk aversion estimated as the ratio of equity to total assets. The estimated coefficient for the CAP is expected to be positive, meaning that the banks with higher risk aversion have also higher margins. CR measures the credit risk faced by individual banks. This measure is proxied by the ratio of nonperforming loans to total loans. Banks with higher ratio of nonperforming loans face higher credit risk which is further expected to be reflected in higher margins they charge. LA is the logarithm of total assets, taken as a proxy for the size of operations. The theoretical model predicts positive relationship between the size of operations and the margins since for a given value of credit and market risk larger operations are expected to be connected to a higher potential loss. On the other hand, however, the economy of scale suggests that banks which provide more loans

should benefit from their size and have lower margins. Therefore, we do not have a particular prior regarding the expected sign of this coefficient. Finally, *LIQ* is the ratio of liquid and total assets, proxying the liquidity of banks. Higher liquidity ratio corresponds to higher opportunity costs, which is expected to contribute to increase of the margins. Table 1 that follows contains description of individual variables, as well as the anticipated sign of their impact based on the theoretical argumentation.

Table 1: Variable description and expected impact on the bank interest margin

Variable	Notation	Description	Expected impact
Net interest margin	NIM	interest income minus interest expenses divided by total assets	N/A
Herfindahl index	HERF	the sum of squares of individual bank asset shares by regions	+
Personnel costs	PER	personal costs to total assets	+
Capitalization	CAP	ratio of equity to total assets	+
Nonperf. loans	CR	ratio of nonperforming loans to total loans	+
Size	LA	total assets (logarithm), mln.RUB	?
Liquidity ratio	LIQ	ratio of liquid assets to total assets	+

3.2 Data

Our dataset covers all banks operating in Russia during the 1999-2007 period. It consists of banks' quarterly balance sheets and profit and loss accounts. The data comes from the financial information agency Interfax and the Central Bank of Russia (CBR)². The sample period starts in 1999 which prevents our results from being directly influenced by the 1998 crisis. Data constitutes an unbalanced panel, because there were banks entering and leaving the market due to mergers or failures. We clean the data first by excluding the observations for which

² For more detail description see Karas and Schoors (2005).

the total loans to total assets ratio is lower than 5%. Moreover, for each of the explanatory variables, we account for potential outliers by removing 0.5% of both tails of each variable in every quarter.

Our data has two major advantages over the panels used in previous studies. First, it covers the whole banking sector and, thus, unlike the Bankscope dataset widely employed in previous studies, it is not subject to the selection bias. Second, the data contains detailed information on bank ownership structure, which allows us subdivide the total sample into three subsamples composed of state-controlled, private domestic and foreign-owned banks.

As it is standard in the literature, the net interest margin (NIM) is defined as interest income minus interest expenses divided by total assets. Overall, the margins have been decreasing during the period under review, going down from 2% in 1999 to 1.5% in 2007 (see Table 2). This indicates that the process of financial intermediation from the perspective of the society became less costly.

Table 2: Mean values of bank interest margins and its determinants over time

	NIM	HERF	PER	CAP	CR	LA	LIQ
1999	0.0201	0.2073	0.0095	0.2805	0.0475	4.9204	0.3126
2000	0.0199	0.2039	0.0105	0.2593	0.0349	5.2922	0.3290
2001	0.0200	0.1875	0.0116	0.2653	0.0248	5.7601	0.3030
2002	0.0194	0.1775	0.0114	0.2686	0.0214	6.1451	0.2949
2003	0.0177	0.1781	0.0106	0.2474	0.0206	6.4881	0.2922
2004	0.0170	0.1740	0.0101	0.2430	0.0196	6.7192	0.2688
2005	0.0169	0.1773	0.0097	0.2266	0.0213	7.0104	0.2653
2006	0.0159	0.1994	0.0099	0.1863	0.0193	7.5300	0.2475
2007	0.0150	0.1998	0.0097	0.1947	0.0198	7.6196	0.2320

Note: Data for 2007 concern only the first quarter

Development of the interest margin determinants for the whole banking system during the period under consideration suggests that they could have had an important impact on the margins. More specifically, risk aversion and liquidity exhibited downward trend suggesting that

these factors have contributed to the declining pattern of the interest margins in Russia. On the other hand, size of banks has been rising during the period under consideration, while operational expenses fluctuated around the same level. Credit risk measured by the ratio of non-performing loans to total loans was declining in the aftermath of the Russian crisis, going down from 0.05 in 1999 to 0.02 in 2002, but then remained constant during the period 2002-2007. Banking sector became a little bit less concentrated in the 1999-2005 period, during which the Herfindahl index has declined from 0.21 to 0.18. The market concentration has picked up since then, reaching the level comparable to 1999 at the end of period under review.

Table 3: Average interest margins by ownership groups

	1999	2000	2001	2002	2003	2004	2005	2006	2007	Average
State-controlled	0.0213	0.0238	0.0210	0.0210	0.0163	0.0164	0.0151	0.0129	0.0133	0.0179
Domestic private	0.0201	0.0199	0.0201	0.0195	0.0179	0.0171	0.0170	0.0161	0.0152	0.0181
Foreign-owned	0.0189	0.0130	0.0132	0.0122	0.0139	0.0136	0.0149	0.0141	0.0142	0.0142

Net interest margins further differ by ownership groups (see Table 3). On average, margins are the lowest for foreign owned banks and the highest for the private domestic banks. The difference between private and state-controlled domestic banks is however not significant. If we consider interest margin a proxy for efficiency of financial intermediation, this kind of ordering of banks is in line with the finding concerning bank efficiency in Russia. Karas et al. (2008) find that foreign banks in Russia are the most efficient and domestic public banks are more efficient than domestic private banks.

All in all, the preliminary analysis suggests that the development of interest margin determinants has exhibited different tendencies. The following section analyses the quantitative impact of these variables on the bank interest margins by the means of the regression analysis. We evaluate how the impact differs across banks with different ownership structure.

4. Estimation results

We estimate three models, one for each ownership structure, in order to capture the differences in the impact of interest margin determinants for state-, domestic private- and foreign-owned banks. State-controlled banks are defined using the list provided in Vernikov (2007). The bank is considered to be foreign-owned, if more than 50% of its stake is owned by a foreign entity. We use information from the CBR to identify these banks. The rest of the banks (the major part of the sample) are defined as domestic private.

Table 4 summarizes the estimation results for each ownership structure. The table shows that the impact of some determinants is consistent across banking groups, but there also exist some differences. First, the results suggest that margins in neither of the banking groups are affected by changes in the market structure. This contradicts results in the relevant literature, which are in most of the cases significant, even though with different sign for developed and developing markets (see Claeys and Vander Venet, 2008, who found positive impact for the Western and accession countries, and negative impact for non-accession countries) and it might reflect the fact that market structure in Russia did not change substantially over time. There are some major players in the market (e.g. Sberbank) and changes in the rest of the banking system are not sufficiently large to influence the overall structure of the market.

Next, as suggested by the theoretical model, operational costs incurred by banks in each of the ownership groups are transmitted to their clients through higher margins charged for their financial services. In line with the theoretical prediction, the impact of operational costs is positive and in economic terms the most sizable across the margin determinants for each ownership group (see Table 4). This finding implies that all banks respond similarly to changes in operational costs when setting the interest margin.

Table 4: Estimation results and their economic significance

	STATE-CONTROLLED BANKS		FOREIGN BANKS		DOMESTIC PRIVATE BANKS	
	Est.coefficient	One sd effect	Est.coefficient	One sd effect	Est.coefficient	One sd effect
HERF	-0.0072	-0.0017	0.0167	0.0016	-0.0004	-0.0001
PER	0.5246 ***	0.0034	0.4141 ***	0.0024	0.4510 ***	0.0033
CAP	0.0090 ***	0.0010	0.0011	0.0001	0.0013 **	0.0002
CR	-0.0066	-0.0002	-0.0138 *	-0.0006	-0.0138 ***	-0.0005
LA	0.0006	0.0015	0.0012 *	0.0022	-0.0008 ***	-0.0013
LIQ	-0.0040 *	-0.0006	-0.0075 ***	-0.0013	-0.0046 ***	-0.0007
Obs.	769		546		20195	
Banks	33		58		1187	

Note: We report estimated coefficients as well as their significance (*** significant at 1% level, **significant at 5% level, * significant at 10% level). Seasonal and yearly dummy variables as well as constant term are included but not reported. Economic significance is measured by the impact of one standard deviation change.

Another determinant which impact on the interest margin is comparable across groups is liquidity. The impact of this determinants is however negative, which is in contrast to the theoretical model and also to empirical findings from cross-country studies (see, for instance, Maudos and Guevara, 2004). Perhaps this reflects the fact that those banks that have higher liquidity are better performing ones, with better reputation, who get involved into more stable business and set lower margins. This result may further indicate differences in the operations banks are involved in.

The impact of other variables varies across groups. Risk aversion measured by the capitalization ratio seems to be an important factor for state-controlled and domestic private banks, while this coefficient is not significant for foreign-owned banks. These differences may be related to the existence of moral hazard problem. As indicated by Schwaiger and Liebeg (2007), behaviour of thinly capitalized banks in terms of pricing policies differs from the one of their counterparts. Naturally, one could expect that foreign-owned banks do not need to reveal their credibility by the means of higher capitalization when setting deposit and credit rates, which might explain the insignificant impact.

In addition, we find significant impact of credit risk only for domestic private and foreign banks. However, the signs are negative, which is in contrast to the predictions from the theoretical model. On the other hand, the negative coefficient is in line with the findings of Williams (2007), who found negative association between credit risk and interest margins for the case of Australian banks. Intuitively, the negative sign implies that banks are doing a poor job in terms of controlling for credit risk when setting up the interest margin. Nevertheless, it might also indicate the more aggressive strategy of foreign-owned and domestic private banks that are fighting for the market share and thus are willing to accept higher credit risk without changes in the margins they charge.

Finally, the impact of the size of operations is significant only for foreign and domestic private banks. The direction of the impact is however different: the impact is positive for foreign banks and negative for domestic private banks. This finding does not contradict the theoretical prediction since the impact of this variable was a priori undetermined (see Table 1). The economic impact of this variable is sizable, the second largest one following the impact of operational costs (see Table 4 above). It is also necessary to bear in mind that the measure of size is correlated with the market share of the individual bank in our case. Taking this into account we could argue that big foreign-owned banks are able to benefit from their size by setting higher margins. On the other hand, domestic private banks are forced to decrease the margins as soon as they start to benefit from the economies of scale.

5. Conclusion

This research provides the first evidence on the determinants of bank interest margins in Russia and the role of the bank ownership. Unlike previous studies, which evaluate the impact of bank ownership by introducing dummy variables, we estimate separate regressions for banks

with different ownership to allow for the impact of interest margin determinants to vary across different ownership structures. Our findings lend support for the hypothesis that bank ownership has important implications in terms of the impact of the theoretically motivated determinants on bank interest margin. The obtained results emphasizing the importance of the bank ownership structure call for reassessment of previous empirical findings on interest margin determinants, especially for those panel data studies that include countries with significant differences in the banking sector ownership structures.

We find that bank risk aversion, a commonly used determinant of interest margins, has significant explanatory power only for the case of domestic banks (private and state). This variable does not play a significant role for foreign-owned banks, which may reflect the beneficial position of foreign owned banks in Russia in terms of their trustworthiness. Similarly, there exist differences in terms of the impact of credit risk on the interest margin: the impact is only significant for foreign and domestic private banks. The insignificant impact for public banks implies that these banks do not take into account the credit risk in their pricing strategy at all, while the foreign and domestic banks “get it wrong”, given the unexpected negative sign of the impact (similar result for Australian banks was obtained by Williams, 2007). In addition, while the impact of the size of operations is only significant for domestic and foreign banks, the impact of this variable differs across these banking groups. Foreign banks charge higher margins for more “weighty” operations in order to compensate for larger risks associated with possible default on the operation. Domestic banks charge lower margins for larger scale operations, which reflects the economies of scale effect.

There also exist some similarities across banks with different ownership structures. First, the impact of the market concentration is insignificant, which is in contrast to the previous findings (e.g. Claeyns and Vander Venet, 2008), probably reflecting the specific features of the

Russian banking system. Second, significant and economically sizable impact of operational costs across groups justifies the extension of the basic dealership model by Maudos and Guevara (2004), which includes this important variable. Finally, interest margins set by all banks are affected by liquidity. The size of the impact is however unexpectedly negative, suggesting that there might be some other mechanisms working for the case of Russia.

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