

Bank branches in Russian regions: estimation of the role of distances and other factors of spatial distribution

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In the past two decades, Russia has seen a decrease in the number of banks and since 2014 also in the number of bank branches, both as a result of the concentration and consolidation processes taking place in the banking industry throughout the world, and as a result of the banking sector sanitation "cleaning" policy pursued by the CBR.

As a result, there is a weakening of the positions of medium, small and regional banks, which leads to reduction in the number of regional banks in favor of large interregional banks with extensive office networks and head offices mainly in Moscow.

Obviously this structure of the sector complements the highly centralized and nationalized nature of the economy as a whole, which is manifested in the concentration in Moscow of both the head offices of large companies operating nation-wide and their financial resources and the state financial resources. Representatives of the banking community are increasingly stating the actual disappearance of such a thing as "regional banking system". Now banking activities in the country are conducted primarily by banks with head offices in the capital. According to the data of the Central Bank of the Russian Federation at the beginning of 2019, 88% of bank branches and about 90% banks' operations in the regions outside Moscow referred to non-local, predominantly Moscow banks, majority of which with are state-controlled.

Obviously, large bank's size and large office network has substantial advantages. Studies in financial geography indicate that the geographically centralized financial system may hamper financial development and sufficient lending in regions away from financial centers (Alessandrini et al., 2016, Klagge et al., 2017, Papi et al., 2017, Presbitero et al., 2014, Udell, 2009). The significant distance between the local office and the head office of the bank creates problems of control, motivation of local managers and information asymmetry between the head office and the local office of the bank, which can reduce effectiveness of remote bank branches. And with the development of new technologies, the problem does not completely disappear (Flögel, 2019). When establishing of bank branches in new geographic locations bank may follow large customers who operate in other regions or want to expand their retail network. Often this happens through mergers and acquisitions. In any case, geographical remoteness can be the obstacle for the process. As a result, banking networks tend to open more branches in the vicinity of the head office, and fewer

branches in remote regions or countries (Buch, DeLong, 2004, Focarelli, Pozzolo, 2005, Magri et al., 2005, Felici, Pagnini, 2008, Fuentelsaz, Gomez, 2006, Huang, 2019, Nagano, Ushijima, 2018). However, large banks can be an exception - they are able to maintain office networks almost independently of distances and also the role of distances decreases because of the development of transport, communications and information technologies (Felici, Pagnini, 2008). At the same time, different banks and types of banks may have a different strategy for the spatial distribution of their offices (Alamá, Tortosa-Ausina, 2012).

The facts raise the question of the consequences of the concentration of head offices of banks in one financial center for such large country like Russia. The presence in the locations of a sufficient number of banking offices is still a significant factor, especially for the households and small firms, despite the development of remote financial service technologies. The ability of large banking networks dominating in Russia to provide financial services throughout the country crucially influences financial inclusion, financial development and competition in the banking sector in Russian regions.

So the article discusses the implications of such a geographical centralization of the Russian banking sector in terms of providing the regions with a sufficient number of bank offices. The purpose of the study is to assess the impact of distances on the ability of banks to maintain their presence in the regions, as well as to identify differences in this regard between different categories of banks, taking into account the type of ownership, the localization of the head office and the size of the banks.

CBR states that although the number of bank branches in Russia has been declining since 2014, this is also happening in developed countries with the development of remote banking technologies. The number of bank branches per capita is also on average level for developed countries and the variation in this indicator between different Russian regions is not very large. At the same time, it is ignored that different countries and regions may have a different need for the number of bank branches per capita due to differences in the structure of the economy and the financial sector, population density, and features of settlement throughout the territory.

It is very difficult to analyze the banking sector in the regions of Russia, because in the process of centralizing banking supervision and reporting, statistical data in the “bank-region” form became practically unavailable for researchers with very few exceptions. One of them are data on presence of the banks offices in the regions which we use here.

The CBR website provides information on how many branches Russian banks have in the regions, what kind of branches and so on. The study uses information about 489 credit institutions at the end of 2018 (and there are mainly banks and a small number of non-bank credit

organizations). We considered 81 region, without the Republic of Crimea and the city of Sevastopol; Nenets Autonomous Okrug, Yamalo-Nenets Autonomous Okrug and Khanty-Mansi Autonomous Okrug are considered separately, Arkhangelsk and Tyumen Regions - without autonomous districts; Moscow and the Moscow region, St. Petersburg and the Leningrad region are considered together.

Russian regions are very different in the number of banks which have their units in the region (326 in Moscow and 2 in the Republic of Ingushetia) and in the number of offices (4288 and 11 in the same places). Banks also vary - from the Sberbank of Russia that presents in all regions with 14 thousand units and other major banks to small banks with only one head office.

As in (Nagano, Ushijima, 2018) we use two types of distances affecting ability of banks to have units in geographic locations - (1) the distance from the head office to the location and (2) the distance to the nearest other location where there are offices of this bank (if there is no such location this observation is skipped). Though these variables are correlated they affects different things. The former influences the contacts between local offices and head offices, problems of management and control, information asymmetry, while the latter affects banks' involvement in local economy, knowledge of local feature and so on.

Based on available information we analyze how the number of offices of each bank in any region depends on bank's characteristics, region's characteristics and on two types of distances.

General specification looks like this:

$$\ln Nof_{ir} = \alpha_0 + X_i * \alpha - \eta \ln d_{ir} + \mu \ln d_{ir} * m_i + Y_r * \beta + \varepsilon_{ir}$$

Nof_{ir} - the number of offices of the bank i in the region r ,

X_i, Y_r - vectors of characteristics of the bank i and region r respectively,

d_{ir} - the distance from the region r to the head office of the bank i (1) or the distance to the nearest other region where there are offices of the bank i (2),

m_i - dummy variable of location of bank's i head office in Moscow,

α, β - vectors of estimated parameters, η, μ - distance parameters.

The estimated equations reveal the role of distances in distribution of banks' offices across the Russian territory, taking into account the total number of units in each bank that reflects bank's size and other characteristics affecting the propensity to form branches in each region. To take into account all the features of different banks we also use banks' fixed effects.

We use the total number of offices of all banks in any region and regions' fixed effects to

take into account regional characteristics. Slightly more than half (248 out of 489 at the end of 2018) of banks have their head offices in Moscow, so the distances between the local offices and the head offices are often the distances between Moscow and different regions and can be negatively correlated with the total number of offices of all banks in the region and with the regions' fixed effects. Because of that estimations with them may be inaccurate.

To tackle the issue we identify various regional variables affecting the number of bank branches in the regions. First of all it is population size. The others are the gross regional product and level of its diversification; the region's status in the federal system (regions with republic status and the share of the "titular" population in them; regions with the city-capitals of federal regions); population density, urbanization (share of urban population; share of population living in the largest city in the region), education (share of people with higher education, share of university students), and others. We suppose that these variables can stimulate or prevent banks to open branches in the region.

Estimations are made using Poisson regression method which used to estimate the gravity models of interregional trade. In this case is assumed is that errors' variation is equal to the average of dependent variable (if number of bank's offices in region is large then error's variation is greater but variation of error in percentage of dependent variable average is less). Also, as in the case of interregional trade, the number of zero values is large because not all banks have offices in all regions. This method allows not to ignore zero values but to consider them as very small. To additionally deal with heteroscedasticity issue robust standard errors are used.

We estimate many specifications of the basic equation: for all banks in the country and for various types of banks by type of ownership, size of banks and location of banks' head offices in Moscow or another region. Specifications for some individual banks were also estimated. Here we do not show all estimation results but provide only some of them in the table and main conclusions.

The estimations show that although for all banks on average distance is a significant factor for the presence of bank offices in the regions this result is almost entirely achieved because of small and regional banks.

More than half of Russian banks are registered in Moscow. Many of them initially originated in other regions but then moved their head quarters to the capital. We introduce variables of distances multiplied by dummy variable on location of banks' head offices in Moscow to show that for Moscow banks the distances are always less important. That is true for banks of any size and ownership type. It turned out that the influence of distance from region to bank's head office is stronger for regional non-Moscow banks in all specifications. For them two-time increase in the distance between region and head office leads to 15-30% decrease in number of offices in the

region. Two-time increase in the distance between any region and nearest region with offices of the same bank means 20-50% decrease in number of branches in this region. And this is true for all banks. Thus, on average, all banks tend to have offices closer to the existing ones but regional banks also closer to their head office.

Estimation of impact of distances on number of banks' branches in Russian regions,

all banks (489 in November 2018).

variables (in logarithms, except for share variables)	Dependent variable is the number of bank's i branches in region r						
	Poisson regression, pseudo maximum likelihood estimation						
	1	2	3	4	5	6	7
distance "region r - head office of bank i"	-0.25*** (0.03)		-0.45*** (0.04)		-0.53*** (0.03)	-0.49*** (0.03)	-0.49*** (0.03)
distance "region r - the nearest other region with the bank's i units"		-0.31*** (0.033)		-0.95*** (0.068)			
distance "region r - head office of bank i" * dummy variable for Moscow banks	0.07*** (0.01)		0.04*** (0.01)		0.47*** (0.07)	0.41*** (0.05)	0.44*** (0.05)
population in region r						0.97*** (0.04)	0.89*** (0.04)
GRP per capita in region r							0.17*** (0.06)
population density in region r						-0.08** (0.03)	
share of population in the largest city of the region r						-0.59** (0.25)	-0.74*** (0.25)
share of "titular" population in the regions with republic status (0 for other regions)						-0.54*** (0.18)	-0.55*** (0.18)
number of offices of all banks in region r	0.68*** (0.05)	0.94*** (0.057)					
number of offices of bank i in all regions	0.98*** (0.03)	0.98*** (0.016)	0.99*** (0.02)	0.99*** (0.02)			
dummy variable for banks	no	no	no	no	yes	yes	yes
dummy variable for regions	no	no	yes	yes	yes	no	no
number of banks	489	489	489	489	489	489	489
number of regions	81	81	81	81	81	81	81
number of observations	39609	39361	39609	39361	39609	39609	39609
Pseudo R2	0.84	0.85	0.87	0.85	0.88	0.87	0.87

Then we made the similar estimations for different types of banks and individual banks.

The role of distances in forming of banking network is affected by the fact that bank's head offices is located in the capital and also by the size of the bank and of it's office network.

Moreover, these two factors may be related - large banks, as a rule, have a head office in the capital.

Therefore, we made estimations for banks of comparable size (size of their office networks). For example, for banks with number of their offices less than 10 offices, then from 10 to 20, from 20 to 30 offices, and so on.

Our results show that for larger banks the role of distances is less. For the thirty largest banks with more than 125 offices the role of distances almost disappears.

The role of proximity to offices of the same bank in the neighbouring regions has some significance even for large banks, but for the largest ones it also disappears. Large banks are better able to overcome the difficulties associated with distances. The conclusion corresponds to the research results for other countries.

Similarly we compared regional and Moscow banks of comparable size. We found out that even when office network size is comparable, regional banks tend to have more units near their head office, while Moscow banks of the same size have more offices located at substantial distance from their headquarters. Thus the fact that the head office is located in the capital has strong connection with the ability of banks to have their units in other regions. For large Moscow banks, distances do not matter at all, while for large regional banks they are important factor (for example, Bank Vostochniy with 640 offices in 68 regions), with some exceptions when (VTB with 1591 offices in 75 regions and Sovcombank with 447 offices in 70 regions that are not registered in Moscow).

Even at comparable sizes, Moscow banks often have offices throughout the country, while regional ones are more often focused on their own and neighbouring regions. The Moscow headquarters position allows banks to better realize their interests in other regions and to have strategy to expand their business to remote locations. That is also true for the banks that formerly were regional ones. We suppose that huge advantages of Moscow over other regions are crucial here. That is the best transport accessibility and connection to all other regions and the great institutional and economic advantages of having head offices in the capital.

Also we identify regional features that affect the number of banks' offices located in them. The variables used to identify regional factors which attract banks' units to the regions are shown in the table.

For all banks the main factor affecting the number of banks' branches in any region is population size. This is not surprising because usually the aim of the bank offices is to provide financial services to households. The other variables were used with the population size as control variable. Different regional variables are often correlated with each other so to use large number of them simultaneously is impossible. The gross regional product (per capita) and the average per capita income are not very important in forming the number of banks' offices - they are significant not in all specifications and not for all banks.

Banks are reluctant to work in the regions with republic status and large share of the “titular population” (according to the last 2010 census) even when taking into account population size and income. This mainly because of the specifics of the North Caucasus Federal District.

Large square of the region (low population density) which may lead to greater population dispersion across territory, encourages banks to open more offices, all else being equal. While population concentration in one main city allows to maintain relatively few offices in this region.

Some banks, especially banks with foreign ownership tend to have offices in the regions with the cities-capitals of federal districts. The other variables like the share of urban population, the level of education affected number of banks' units only slightly positively and their influence is difficult to separate from the role of the population size.

Regional factors that affect the number of banks' offices

Variables	How they affect the number of banks' offices
Population size	The most significantly and positively
GRP per capita, income per capita	Significantly and positively but not in all specifications and not for all banks.
Republic status or share of "titular" population in (0 for other regions)	Strongly negatively
Regions with cities - capitals of federal districts	Positively but not in all specifications and not for all banks.
Diversification of GRP (HHI for GRP structure)	Significantly for some banks (positively or negatively)
Population density	Mostly negatively
Share of population living in largest city in the region	Mostly negatively
Urbanization (share of urban population in total population)	Slightly positively
Education (share of students and people with higher education in total population)	Slightly positively

The purpose of the study was also to identify differences between different kinds of banks by ownership type: between private banks, banks with foreign owners and banks with different types of state ownership. The classification of all Russian banks is taken in the paper specifically devoted to the issue (Vernikov, 2018).

Our results show that the composition of banks' owners, taking into account size or whether a bank is Moscow or regional one, does not affect banks' strategy in placing their units. Thus, the

largest Russian private banks (for example, AO «ALFA-BANK») and some banks with foreign capital (for example, ROSBANK PJSC), as well as the largest state-owned federal banks, have office network throughout the country regardless of distance. At the same time regional banks under the control of regional authorities, as well as private regional banks, are more focused on their own and neighbouring regions.

Thus the large Moscow banks that have numerous branches, in their strategy for placing offices, are guided by the regional characteristics regardless of the distances from their head offices. First of all, it is Sberbank of Russia, which has offices in all regions and 14 000 units or 46% of all banks' offices in the country. At the same time, for small and regional banks, the distance factor remains significant. The most important fact is the location of bank's head office in Moscow. The fact defines the tendency of banks to form units in other regions, both for state and private banks.

Although geographical distances in Russia are huge, the large office networks throughout the country are provided by the largest state-owned banks and several largest private banks, as well as some banks with foreign participation, regardless of distances. Therefore availability of banking offices in regions does not suffer with increasing distances from Moscow. The largest banks, like Sberbank of Russia and others, in their office-placing strategy primarily focus on population size and also have relatively more offices in regions with low population density and greater population dispersion throughout their territory. Thus financial inclusion is provided mainly by the largest, most often state-owned banks.

At the same time the CBR recognizes the problem of access to banking services in remote and sparsely populated areas. It even offers to impose obligations for the most significant banks to maintain banking units in such locations. So it is supposed to ensure further financial development by the means of the largest Moscow banking networks. From this point of view, the concentration of banks' head offices in Moscow looks somehow justified, because having bank's headquarter in Moscow stimulates banks to expand their office network to remote regions.

Regional banks are often functioning locally and distance factor is important for them. Moscow and regional banks have different strategies. The former take advantage of the larger scale and location in the capital, while the latter are more focused on local context and contact with customers, knowledge of local features, as described in the literature on other countries.

Therefore, it seems optimal to have in each region a sufficient number of local and non-local banks, both private and state-owned, which would enable to have a more complete set of financial institutions with different features and create an adequate level of competition.

In 2018 banking licensing reform with this purpose was initiated. In accordance with it, in

order to maintain and strengthen competitive processes in the banking sector CBR is switched to proportional regulation of banking activities, which is designed to ensure a more proportionate distribution of regulatory and supervisory burden on banks.

The reform should create easier administrative regulatory and supervisory burden for small banks, thereby promoting competition. Since the second half of 2018, the active transition of small banks to the basic license began, but nevertheless the total number of banks, including regional ones, continues to decline. It is not yet clear whether this reform will contribute to breaking down the trend of falling number of banks and nationalization of the banking sector. This is especially true for some regions where regional and private banks are missing or their role is very small.

The results showed that the largest banks in their office placement strategy are oriented on the characteristics of locations, regardless of their distance from the bank's head office. At the same time, the type of ownership does not matter much, although in fact availability of financial services and financial inclusion across the country's territory is largely ensured by the largest state-owned banks. The strategy of placing offices is also associated with the location of the bank's head office in Moscow or elsewhere. The remaining regional banks often act locally and for them distance is a significant factor of the branch network formation. Despite the reform of banking licensing of 2018, the decline in the number of banks is continuing and the level of competition and diversity in banking sector in the regions remains in question.

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