Transparency and Market Discipline: Evidence from the Russian Interbank Market[1]

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Abstract: This paper investigates the role of voluntary bank disclosure in the interbank market. Using the data on 179 largest Russian banks over the period of 2004-2013 we test the sensitivity of interbank loans and deposits to transparency levels. We show that larger but more risky banks – at least in terms of credit risk - behave more transparently and disclose more. The article is also the first to show evidence that the ability to attract funds in the interbank market is positively correlated with the volume of interbank loans and deposits. This result is stable for various aspects of transparency such as disclosure of risk, financial performance, or board composition.

Keywords: banks, interbank market, disclosure, transparency, banking governance

JEL Classifications: G21, P2

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1. Introduction

During the last two decades, the Bank of International Settlements (BIS) have advocated for a more transparent international banking sector. Its recommendations have evolved since the first Basel agreement of 1988. The Basel II of 2004 is the starting point of the global enhancement of disclosure and transparency for banks located in countries which ratified the agreement. It is not the first attempt on enhancing disclosure but it is a first as a generalized attempt. The disclosure resulting from the implemented regulation provides information useful to bank counterparties such as depositors, investors or even regulators. A growing literature has been analysing the benefits of bank disclosure and transparency. One of them is the enhancement of financial stability. Disclosing information, regarding the financial situation of a bank, decreases individual risk and total risk (Akhigbe & Martin, 2006). It is particularly helpful at reducing financial instability when bank managers are able to manage the risk of their investment portfolio as presented by Cordella & Yeyati (1998) and Cordella & Yeyati (2002) or Vauhkonen (2012). Therefore, disclosure should appear as a prerequisite of market discipline as suggested by Flannery (2001).

The Russian banking sector exhibits is particularly appropriate to test the impact of transparency and disclosure for several reasons. First, the development of the modern Russian banking sector is fairly recent and highly dynamic with a various set of participating banks, where large state-owned banks are competing with domestic privately owned institutions and foreign subsidiaries. The Russian banking sector has evolved over the last three decades: the early 1990's, after the end of the Soviet era, have seen a striking amount of bank licenses issued by the Central Bank of the Russian Federation (CBR). The size of the banking sector has now shrunk to reach a number of 517 active banks[4] by February 2018. Secondly, it is dominated by state-owned and state-controlled banks which account – according to CBR[5] - for up to 64% of the deposit market and up to 67% of the credit market, as for early 2017. The predominance of state-owned banks, and therefore of public implicit guarantees, might weaken the effect of market discipline due to moral hazard as pointed out by Gropp, Gruendl, & Guettler (2014) or Acharya et al. (2016). State-owned bank's manager might have incentives to only satisfy minimum mandatory criteria with the help of the implicit guarantees. Thus, it becomes a necessity to control for the presence of such banks in the results.

The aim of this article is to analyse whether voluntary disclosure by banks plays a role in interbank relationships. We analyse the relationship between disclosure by banks and their ability to attract the interbank loans and deposits for the period 2004-2013. Since the interbank market is mostly used to fulfil capital and liquidity requirements, the disclosure of information, allowing transparent banks to obtain more funds from the interbank market, may be considered as an important factor facilitating its access to liquidity. It would also imply banks monitor other banks and their ability to disclose information, which reflects their financial status. Due to the non-volatile characteristic of mandatory disclosure and due to the fact we are not focusing our analysis on the impact of implementation of mandatory rules, we consider only transparency as a vector of voluntary disclosure. More importantly, we consider several components of transparency such as risk and risk management disclosure, financial performance disclosure, information on shareholders events, or board members information.

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[4] As opposed to zombie bank, Karas & Schoors, (2010)
[5] http://www.cbr.ru/publ/bsr/bsr_2016.pdf

The Russian banking sector is usually qualified as lacking transparency (Karas, Schoors, & Lanine, 2008). Moreover, the interbank market have shown liquidity difficulties during the follow up of the subprime crisis where the interbank market froze in September 2008 due to a lack of transparency, leading to a lack of confidence from market participants. A smooth-working interbank market is a key to a well-functioning banking sector and above all to a dynamic economic environment. This article is aimed at answering the questions are interbank loans sensitive to voluntary disclosure?

To test the nature of the relationship between interbank operations and disclosure, we use a common in the literature Blundell & Bond (1998)regressions over panel data. This two-step regression model allows us to test the reasons why banks are transparent, while controlling for past endogeneity while using lagged dependent variables. Using the data on 179 Russian banks, which accounts for almost 95% of the market, we show that voluntary disclosure is negatively related to bank credit risk.In other words riskier banks are more transparent. . This finding is important and sets in the same literature as Spargoli (2012) where banks are better off disclosing negative signal than remaining opaque, in a competitive environment. The second result is the core of our analysis. An increase in transparency levels, positively and significantly increases the level of interbank loans and deposit attracted by a bank. The result is fundamental to answer the relative concern of liquidity on the interbank market and assess the importance of transparency as a tool to further enhance market discipline. This result is particularly innovative: we show that voluntary disclosure, when it convoys information on bank fundamentals, increase interbank borrowing capacities.

This article provides several contributions to the disclosure and market discipline literature. It contributes to the literature emphasizing the benefits of disclosure to access liquidity, such as Baumann and Nier (2008) or Akhigbe & Martin, (2006).It also contributes to the literature dedicated to the Russian banks emphasizing the need of transparency such as Karas et al., (2008). The rest of the paper is structured as follows. The section 2 presents the background, reviewing the existing literature on lien with our article. It will also present briefly the state of the Russian banking sector. The section 3 describes the empirical strategy and the dataset used for the analysis. Section 4 presents our results, while section 5 tests for their robustness. Section 6 concludes.

2. Literature and state of the market
   a. Banking disclosure and interbank governance

Pillar 2 of Basel II, and then Basel III, is aimed at enhancing banking supervision by regulatory authorities and based on the requirements of the first pillar. Pillar 3 is aimed at increasing market discipline to reduce the risk of banks throughout various channels, by increased public disclosure towards market participants (BIS 2006 and 2015). Banks must provide a precise description of the nature of their equity, how adequate they are with their equity regulation and must precise the level of capital expected from for each type of risk (credit risk, market risk and operation risk).

Generally, market discipline is associated with market monitoring as presented by Flannery (2001). Therefore, market participants assess the quality of other market participants with the available information: under the hypothesis of market efficiency, all information is reflected in market prices, borrowing rates or in other channel of communications. Disclosure of information can either be qualitative or quantitative: disclosure of quantitative information relates to a volume of precise and technical financial data, while qualitative disclosure relates in the ease of access and to such data. To this extend, banks are

viewed as information processors (Hyytinen & Takalo, 2002). In the meantime, two kinds of disclosure actions are possible: mandatory disclosure, where banks have to comply with the regulatory rules, and voluntary disclosure, where banks can go beyond those regulatory measures and use different channel or decide to realize information that are not being required to be disclose (attendance of board members at board meeting, for e.g.).

Transparency regulation aims at reducing financial fragility by strengthening market discipline (Hyytinen & Takalo, 2002). A significant share of the literature used voluntary disclosure as a complement to market discipline. More specifically, most of authors studying the existence of market discipline in addition to disclosure have focused their analysis on deposits, share prices or derivatives. Wu & Bowe (2012) or Hasan, et al. (2013) emphasized the monitoring of depositors, while more transparent banks are able to capture a higher share of depositors. The theoretical model of Cordella and Yeyati (1998)) also emphasize the above papers when banks are able to manage the risk of their investment portfolio. Similarly, Bourgain, al. (2012) assesses the disciplining effect of depositors on risk-taking behaviour through the channel of disclosure. For financial market participants, Nier (2005) draws a link between disclosure, market discipline and sound risk taking behaviour. In presence of information, shareholders are able to align their interests with managers', therefore reducing the cost of capital. Alexandre, et al., (2016)showed that most transparent institutions suffer less during period of strong financial instability. The authors showed a negative relationship between credit default swap spreads and level of disclosure at the surroundings of sovereign downgrades during the European Sovereign debt crisis. Dergiades, et al. (2015) considers evidence that voluntary information, dispersed throughout social media and Google search queries, is causally related to CDS spreads.

Even if all the literature presented above emphasize the need and positive effects of disclosure, it still remains negative in certain framework and therefore difficult to apply. Disclosure is costly, directly and indirectly. The cost of disclosure depends on the complexity of the approach used to comply with the Basel II and III Pillar 1 (Farvaque & Refait-Alexandre, 2016). Moreover, Admati & Pfleiderer (2000) states disclosure is costly and a conveyor of externalities in between firms: information about one firm will lead to consequences on other firms. Akhigbe & Martin (2006) and 2008 confirms this statement and justify it by the sanctioning process, by financial markets, of the firms the least transparent. Disclosure is not just costly for firms but also for insiders' shareholders. Disclosure reduces their private profits while taking risk. The information premium compensates the risk premium of investors reducing *de facto* their remuneration as exposed in Hyytinen and Takalo, (2002)).

The case of disclosure can be even more complex for emerging countries, the lack of efficient reporting and accounting standards might negate the quality of evaluation of risk (Rojas-Suarez, 2001). Not to mention, the difference between local standards and international standards this could be leading to conformity costs for firms. In most emerging countries, a vast majority of banks are not listed and lacking liquid financial market (Rojas-Suarez, 2001). Since the disclosing action is not just directed to financial market but also to national regulators, the only prudential control remains in the hands of regulators with strong objectives Transparent and independent relationship between banks and external credit evaluation organism are expected. The risk of collusion[6] between bank managers and regulators is to be worried about in case of poor institutional power. Lastly, largest banks are usually government banks, backed up by

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[6] This is against the objectives of the Basel Committee (BIS 2004)

implicit governmental guarantees, negating potential sanctions by the market (Abbassi, 2007, considering Morocco).

The whole literature presented above is relating disclosure with depositors, financial market and regulators. To our knowledge, this article is the first to implement disclosure as a vector of market discipline on the interbank market. Nonetheless, the case of market discipline on the interbank market has still been little studied. Empirical research confirms the existence of price and quantity market discipline first by Furfine (2001) and King (2008) for the U.S. interbank market. Price discipline is traditionally associated with borrowing rates or amount lent which is correlated to bank risk. It has also been investigated in Europe on the Portuguese market (Cocco, Gomes, & Martins, 2009), the Italian interbank market (Angelini, Nobili, & Picillo, 2011) and more recently in the Russian interbank market by Andrievskaya & Semenova (2015).

Concerning the efficiency of market discipline on interbank market, there are only little contributions to the field. The most notable one are Nier & Baumann (2006), Dinger & von Hagen (2009) and Liedorp et al. (2010). Nier and Baumann (2006) test the hypothesis that market discipline gives banks incentive to limit their risk-taking behaviour. As a result, market discipline is efficient only while government do not intervene. Government intervention reduces its effect. Dinger and von Hagen (2009) supports increased interbank borrowing is correlated with lower perceived bank risk. While on the other hand, Liedorp et al., (2010) shows evidence increasing borrowing leads to increased bank risk.

b. The case of the Russian interbank market

Interbank lending markets are crucial to the overall banking sector. Assuring the liquidity of banks is one of its main functions. According to the CBR, the 30 largest banks accounted for 68% of interbank lending and 74% of borrowing in June 2013 (CBR 2013). Moscow banks dominate the interbank market with up to 94% of all interbank lending and borrowing on July, 1st 2013 (CBR 2013). To be even more precise, more than 80% of the interbank long-term borrowing and lending is realized by state-owned institutions (Egorov and Kovalenko, 2013). Most large national banks have a credit rating equivalent to a decent level of financial sustainability, while foreign banks usually have higher credit ratings according to Egorov & Kovalenko (2013). Other privately owned national, smaller, banks have lower credit rating (BB-, S&P).

 The interest rate is an important monetary tool of the CBR to ensure the liquidity of the Russian interbank sector. The CBR calculates six interbank interest rates with different maturity from one day to one year: MIBID (Moscow InterBank Bid Rate), MIBOR (Moscow InterBank Offered Rate), MIACR (Moscow InterBank Actual Credit Rate), MIACR-IG7 (Moscow InterBank Actual Credit Rate: Investment grade), MIACR-B8 (Moscow InterBank Actual Credit Rate: B-grade) and RUONIA (Ruble Overnight Index Average). The calculation of the monthly interbank rates is realized by averaging daily rates. The different maturities are 1 day, 2 to 7 days, 8 to 30 days, up to 3 months, up to 6 months and as a maximum maturity to 1 year.

Figure 1 shows the evolution of the most general interest rate, MIACR, over the two recent decades, per maturity. It is evident that the financial crisis of 2008-2009 has influenced the interest rate. The MIACR

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[7] The list of borrowing banks with high credit rating for MIACR-IG is available at
https://www.cbr.ru/Content/Document/File/32911/MIACR-IG_e.xls as of January 2018.
[8] The list of borrowing banks with speculative credit rating for MIACR-B is available at
https://www.cbr.ru/Content/Document/File/27807/MIACR-B_e.xls as of January 2018.

began to rise in early 2008 to reach a top high of 12 percent at the beginning of 2009. The high demand for liquidity at the surrounding of the crisis explains such increase. In combination with high demand for liquidity, a phase of mistrust was to be noticed (Bogetic, 2008). According to the author, the two events are following each other, with first a liquidity situation between May to March and then followed by a trust crunch in September, forcing CBR to intervene. By the end of the crisis, the interest rate started to fall back to the 2-3% by mid-2010. By 2012, the liquidity needs started to arise again leading the interest rate to up to 5% until 2013. Following the western sanctions on the Russian Federation, the MIACR as rose to 16.96% (intraday maturity) in January 2015 and is still in between 7.5 to 10% by the end of 2017.

For the year 2017, the volume of interbank deposit operations reached, a total of 12 554 billions of rubles (179 billion euros[9]). Figure 2 shows the distribution of deposit operation per currency. More than half of deposit operations are done in rubble 52.4%, while the rest is done in US dollar 45.7% and 1.3% with Euro[10]. It is worth mentioning that most of the interbank deposit operations in rubble are realized among residents, with a volume of 5.5 trillion rubbles among resident for only 1.02 trillion rubbles for non-residents. Concerning, the interbank deposit operations in US dollar, the opposite effect is visible with 0.1 trillion rubbles of operations in USD among residents and with 5.5 trillion rubbles of interbank deposit among non-residents. In 2017, the vast majority of interbank deposit operations is realized overnight and accounts for 82% of the total operation (with 44% of overnight operation in rubble and 36.86% in USD) for both residents and non-residents. The CBR also provides data regarding REPO operations. Lastly, for the year 2017, 69.35% of interbank lending in volume was realized among residents while 30.65% of the interbank lending volume was realized with foreign banks.

Figure 1 MIACR Evolution, by maturity

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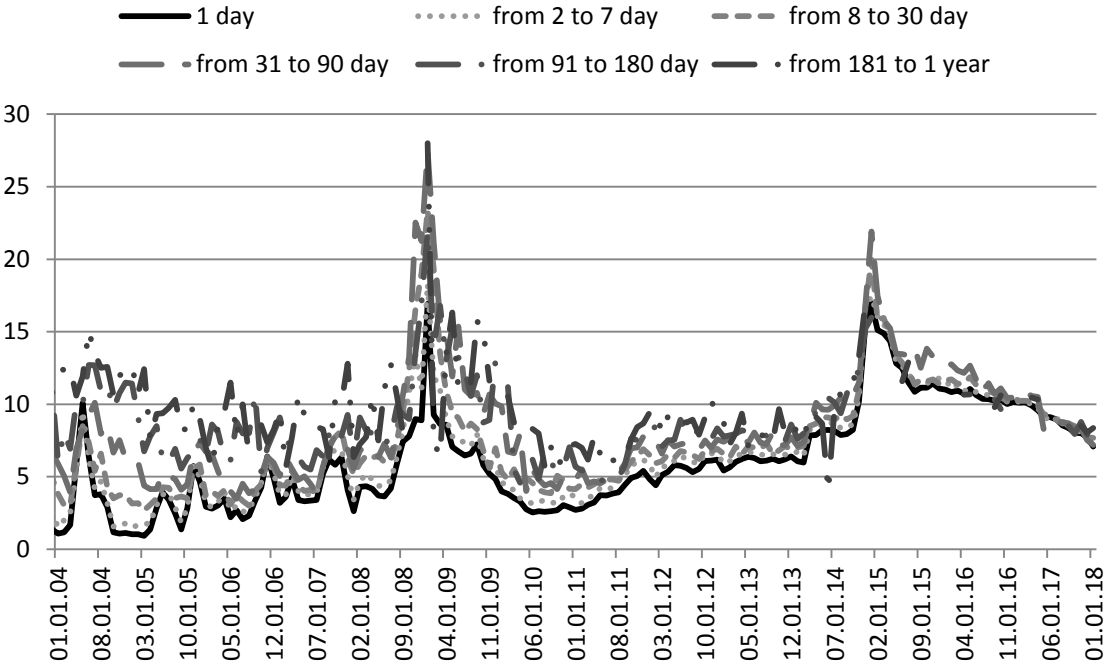
[9] As of February 2018
[10] The data were extracted from the CBR statistic section available at: https://www.cbr.ru/Eng/statistics/?PrtId=finr. The data include unsecured operations.

Karas et al., (2008) observe evidence of low efficiency on the Russian interbank market and a risk of contagion "through indirect liquidity linkages", justified by a lack of transparency and a lack of trust among banks (Fidrmuc & Süss, 2011). The nature of the Russian interbank market and the results observed in the literature has motivated us to pursue a study between transparency and interbank lending.

3. Empirical Strategy and statistical analysis
    a. Data

We use quarterly financial data for Russian banks for the period 1Q2004-2Q2013. The period of study is limited by the availability of the transparency index we were able to access. The data has been extracted from the "Banks and Finance" Analytical System database (Mobile). The database is composed of individual bank financial statements prepared to Russian accounting standards, supply and compiled by the CBR. Originally, the sample was composed of 187 banks which we controlled for potential reporting mistakes[11]. Therefore, the sample used for the different regressions is composed of 179 which represent up to 77% of the market in term of interbank loans and deposits. We controlled the participation of banks which are net borrower on the interbank market for each individual period. The sample has an unbalanced panel structure.

It is worth noticing that we use quarterly data while the available data are prepared monthly. Therefore the interbank positions are estimated as the average positions over a quarter. The largest bank in term of asset in our sample is obviously the state owned bank Sberbank. It accounts for up to 25% of loan market share and deposit nationwide and sometimes 100% of the market in certain regions. State owned banks[12] account for 15% of our sample and so does foreign own banks.

b. Model specification and variables

The specification of our model is important while determining the nature of the regression we will be using for this analysis. The first obstacle is bank disclosure level is not entirely exogenous: it depend on the risk profile of the bank. We based the estimation procedure through a random effect time series regression, by testing the sensitivity of disclosure to lagged CAMEL type bank fundamentals such as capital adequacy ($N1$ capital ratio), asset quality (non-performing loan ratio, *NPL*), share of deposits in total liabilities, the share of loans in total asset and ownership structure (state owned, foreign owned or private). The first step equation is as follow:

$$TR_{i,t} = \beta_i + \alpha.Efficiency_{i,t-1} + \gamma.NPL_{i,t-1} + \delta.DtoAsset_{i,t-1} + \rho.LoanToAsset_{i,t-1} \quad (1)$$
$$+ \lambda.Ownership_{i,t-1} + \epsilon_{i,t}$$

The second obstacle is due to the use of lagged explanatory variable of the independent variable. It helps us to control for past interbank activity but create potential endogeneity and collinearity. The use of the Blundell-Bond (Blundell and Bond, 1998) model allows us to correct for such risk. The appropriate tests include the standard Hansen test (for instrument over identification) and Arellano-Bond test for AR(1) and AR(2).

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[11] We excluded data following the criteria: observations are excluded if the capital adequacy N1[11] is greater is greater than 50, N3 is greater than 500, and non-preforming loans ratio of more than 50%.
[12] CBR owns 50% +1 voting right.

To measure the degree of voluntary disclosure of the operating banks, we compute a set of transparency sub-indexes to cover 6 different components such as ownership structures, corporate procedure, financial information, risk management and board information. The description of each sub-index is available in the table A appendix section 1. The selected criteria are based on available information and using similarities to the Standard&Poors survey approach. In total we have 30 items which relate to voluntary disclosure from a bank. The data was collected manually by web scrapping among the list of questions used in S&P survey. We selected the criteria which relate to voluntary disclosure and separated them in different sub-indices[13]. Separating each component refers to the importance of the nature of the information transmitted. The use of voluntary disclosure in lieu of mandatory disclosure is justified by the individual characteristics of banks, while issued information from mandatory disclosure should remain non-volatile to bank characteristics. The enforcement of the law should prohibit banks to break it. In addition to the general disclosure variable, we added disclosure sub-indices, which reflect more contextual disclosure data. We believe banks are sensitive to different nature of information and therefore convince us to conduct specified analysis based on different information. For the robustness check we also use a transparency index, which is based on the principle component analysis over all transparency measures. In total, we use a general transparency and 6 specific sub-indexes.

The bank controlled by the state, for at least 50% of its share, takes the value 1 and 0 otherwise (*State*). The variable *Foreign* takes the value 1 if the institution is owned by a foreign bank for at least 50% of its share, and 0 otherwise. For example, Rosbank is a subsidiary of the French group Société-Générale and therefore take the value 1.

To determine the impact of transparency and the activity of a bank on the interbank market, we follow a standard approach widely used in the empirical literapture related to disclosure. To estimate the sensitivity of the attracted funds to bank transparency, we use the following econometric model:

$$IBL_{i,t} = \beta_i + \alpha.IBL_{i,t-1} + \gamma.TRp_{i,t} + \rho.BF_{i,t-1} + \lambda.C_{i,t} + \epsilon_{i,t} \tag{2}$$

$IBL_{i,t}$ is composed of the sum of interbank loans no matter the maturity and interbank deposits divided by the total liabilities to account for the bank size. We consider only the quantitative aspect of the market discipline as the change of credit limits is the quick instrument which is widely used by the banks in the interbank market, and the price can be quite sticky. Our explanatory variables include a set of predicted transparency indicators coming from the first step, bank fundamentals, and a various set of control variables.

The vector of bank fundamentals $BF_{i,t-1}$ consists of a set of variables similar to CAMEL variables[14]. The capital variable used is *N1* which is the main bank equity capital adequacy ratio. It is established as the bank equity capital to the overall risk weighted assets minus the sum of loss provisions created for depreciation of securities and possible losses. We used it to measure how a bank can absorb external shocks. According to market discipline principles, well capitalized banks are more likely to be able to borrow interbank loans. The liquidity component is the $N3$ variable which is the current liquidity ratio. It is the ratio of the sum of the bank's liquid assets to the sum of the bank's liabilities on demand accounts and accounts up to 30 days

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[13] For more details, see Andrievskaya and Raschupkin, (2015)
[14] CAMEL stands for Capital adequacy, Asset quality, Management quality, Earnings and Liquidity

according to CBR guidelines[15]. The minimum value of the N3 is set at 50%. The use of the liquidity variable ensures that the more liquid banks are able to borrow interbank loans to the least. In combination, we used lagged loans to asset ratio to monitor bank previous period liquidity and risk. We also use a lagged loan loss (*Reserve Ratio*) provision variable to control the credit risk of an institution. Banks disclose past information in their communication, and not current one.

The earning of the bank is also taken into account in the regression with the use of return on assets (ROA). The interbank literature suggests the variable will impact positively the amount of interbank loan a bank is likely to grant, due to its efficiency. The *ROA* variable we use is a ratio of the net profit over total asset. Bank size control is also part of our analysis; we use the natural logarithm of the bank total asset to mitigate the impact of largely systemic banks. We believe larger firms are more likely to borrow loans on the interbank market than smaller bank because they can benefit from implicit government guarantees. We also control for the ability of the bank to borrow more through the use of a lagged deposit to liabilities ratio. We controlled for the possible effect of past interbank activity (and eventually mitigate reputation effect) on current interbank behaviour.

The vector of controls $C_{i,t}$ is composed of 3 dummy variables to consider the ownership structure and the systemic characteristics of a bank. The nationality and state ownership variable is also used for the second regression. The systemically important characteristic of a financial institution (*SyFI*) is also controlled for: it takes the value 1 if a bank is listed in the CBR guidelines, and 0 otherwise. The list of systematically important institution is available on CBR website[16].

c. Transparency level and sensitivity to bank fundamentals

Before analysing the effect of transparency on the interbank activity of banks, we needed to confirm transparency is a vector of information regarding bank fundamentals. The results of the first step of our participation equation are available in the table 2 in appendix section 2.

According to the literature, two reasons justify the decision to disclose information to the public. In this article, we do not focus on mandatory disclosure; therefore, evoking the reason "comply with the law" is not one of the expected reasons. The main intuition which comes to mind is the idea a bank might want to hide some difficult financial circumstances and in case of partial disclosure (Suijs, 2007). The result is reinforced by the natural externalities where disclosure is armful for the seller due to its competitive disadvantage (Fishman & Hagerty, 2003).

The literature about disclosure and transparency also emphasizes the fact that banks are better off disclosing information when being in a transparent competitive environment. In case, the information convey a negative signal, which is associated with little bank performance, a bank is better off disclosing than remaining opaque. The decision to disclose reduces the value of the stakeholders' information premium. Spargoli (2012) shows this result is particularly appropriate in case of unstable financial environment. Van Tassel (2011) also emphasized a similar result while showing a positive correlation to the number of other banks that disclose information.

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[15] https://www.cbr.ru/eng/analytics/standart_acts/currency_regulations/in_1.pdf
[16] The list is available at: https://www.cbr.ru/eng/press/PR/?file=14092017_142710eng2017-09-14T14_26_24.htm

Table 1 Variable list and Descriptive Statistics

Variable	Variable Description	Obs	Mean	Std. Dev.	Min	Max
L.IBL	Lagged interbank loan and deposit (average over quarter, ratio by total asset)	4707	0..083	0..1	0..000	0..726
Reserve Ratio	Reserve to total loans ratio	5380	0..1	0..1	0.000	0.938
ROA	Return over Asset	5380	0.0	0.0	-0.163	0.388
N3	N3 liquidity ratio of the sum of the bank's liquid assets to bank's liabilities on demand accounts and accounts up to 30 days	5380	90.3	43.3	0.000	468.667
LnA	Natural Logarithm of total asset	5380	17.415	1.841	10.923	24.466
DA	Deposit to Liabilities	5380	0.501	0.210	0.002	0.971
LA	Loans over asset	5380	0.411	0.153	0.003	0.906
State	State owned bank for at least 50% of the shares	5380	0.151	0.358	0.000	1.000
Foreign	Foreign owned bank for at least 50% of the shares	5380	0.151	0.358	0.000	1.000
SyFi	Systemic Financial Institutions	5380	0.072	0.259	0.000	1.000
TR_p	Predicted Transparency summed index	4840	6.529	4.365	-9.495	23.018
TR_S_p	Predicted Transparency, shareholder component	4840	1.042	0.680	-1.798	3.590
TR_C_p	Predicted Transparency, corporate event component	4840	0.582	0.355	-0.621	1.936
TR_F_p	Predicted Transparency, financial information component	4840	2.861	2.059	-4.450	10.534
TR_R_p	Predicted Transparency, risk component	4840	0.998	0.639	-1.402	3.236
TR_B_p	Predicted Transparency, board members component	4840	1.046	0.669	-1.225	3.721
TR_P_p	Predicted Transparency, principal component analysis	4840	0.255	1.070	-3.676	4.298
imr	Inverse Mill's Ratio	3872	3.024	15.333	0.072	406.881

The first step estimation result suggests the second interpretation is valid, where riskier banking institutions tend to be more transparent. The degree of transparency of those institutions is positively correlated with

the lagged ratio of non-performing loans. In addition, it appears the lagged liquidity of the bank is negatively associated with transparency. Those two results are important and reinforce the idea which banks in distress chose to be transparent to ensure participation in the interbank market. For those institutions, participation to such market is important to fulfil capital requirements or to foresee unexpected events.

The first step estimation confirms the idea where competitive banking sector tend to force banks, even with poor fundamentals, to disclose instead of remaining opaque.

The ownership structure appears to also actively influence the decision of bank managers to disclose information. First, larger banks in terms of asset tend to disclose more information to the public. The result is seconded by the positive correlation with the fact that state-owned banks appear more transparent. The composition of the Russian banking sector's market share explains the nature of this relationship where six government owned bank are among the top 10 largest banks in term of asset. Nonetheless, we used a logged variable to treat the problem of potential outliers. The financial information and the board information sub-indexes are particularly correlated to the state interest. Meanwhile, being a foreign bank is positively correlated with the financial information and risk sub-indexes. The non-sensitiveness to the shareholder component or corporate events may finds its origin in the fact that most of those banks are subsidiaries of larger holding companies which do already promote this kind of information to other investors. It is particularly valid for listed public banks such as JSC Unicredit or Rosbank, subsidiary of Société Générale Group.

4. Results.

Table 3 shows the result obtained for our model. We test the transparency impact hypothesis on interbank attractiveness. The first result confirms the effect of previous period interbank activity on current interbank activity. Such result translates into a reputation effect which was already highlighted in the paper Andrievskaya & Semenova (2015) and Egorov & Kovalenko (2013).The reputation effect of active banks on the interbank market is positively and significantly correlated with the endogenous variable. No matter, the specifications of the transparency variable, this result is stable.

The core result of the article concerns the impact of a set of predicted transparency indicators on interbank loan and deposit positions. The result shows the most transparent banks are the more involved in the interbank market. The result is significantly and positively valid for the global transparency index. If we take into consideration individual component of the transparency index, we observe a strong stability of the result whichever the component considered. The strongest result concerns the corporate procedures, while risk and board members' information are also among the most important effect. The monitoring by other interbank participants, throughout the channel of transparency, appears evident in the regression. Interbank borrowers have to appear more transparent to satisfy capital requirement, which is the main reason for smaller banks to participate in the interbank market. The result is important while combined with the result obtained in the participation equation. The combination is explained by the profit maximization problem of banks: in order to satisfy capital requirements, at the lower cost[17], bank managers decide to disclose information to reassure market participants. In our case, other banks, participating to the

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[17] Made possible by the reduction of the information premium, possible with the higher disclosure rate as shown in Spargoli, (2012) or van Tassel (2011).

Table 2 Dependent variable: interbank loan and deposit

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
			Independent Variable: interbank loans and deposit				
TR_p	0.0151***						
	(0.0029)						
TR_S_p		0.0840***					
		(0.0153)					
TR_C_p			0.1954***				
			(0.0409)				
TR_F_p				0.0336***			
				(0.0064)			
TR_R_p					0.0956***		
					(0.0191)		
TR_board_p						0.0985***	
						(0.0193)	
TR_B_p							0.0619***
							(0.0121)
L.IBL	0.7364***	0.7406***	0.7346***	0.7360***	0.7336***	0.7418***	0.7391***
	(0.0326)	(0.0322)	(0.0317)	(0.0321)	(0.0323)	(0.0327)	(0.0317)
Capital/Asset	-0.1330	-0.1535	-0.1059	-0.1409	-0.1223	-0.1466	-0.1366
	(0.1085)	(0.1095)	(0.1120)	(0.1112)	(0.1123)	(0.1085)	(0.1127)
Reserve Ratio	-0.0769**	-0.0556	-0.0836**	-0.0684*	-0.0783*	-0.0957**	-0.0779*
	(0.0388)	(0.0385)	(0.0414)	(0.0403)	(0.0416)	(0.0391)	(0.0399)
ROA	0.1519	0.2227*	0.0699	0.1369	0.1500	0.1376	0.1600
	(0.1156)	(0.1324)	(0.1035)	(0.1115)	(0.1152)	(0.1049)	(0.1156)
N3	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
LnA	-0.0338***	-0.0306***	-0.0362***	-0.0353***	-0.0318***	-0.0313***	-0.0341***
	(0.0068)	(0.0060)	(0.0078)	(0.0071)	(0.0067)	(0.0066)	(0.0070)
DA	-0.1693***	-0.1784***	-0.1624***	-0.1613***	-0.1665***	-0.1797***	-0.1690***
	(0.0248)	(0.0255)	(0.0257)	(0.0245)	(0.0245)	(0.0263)	(0.0246)
LA	0.1164***	0.1190***	0.1134***	0.1168***	0.1112***	0.1235***	0.1168***
	(0.0307)	(0.0308)	(0.0313)	(0.0309)	(0.0313)	(0.0314)	(0.0312)
State	0.0188	0.0393	0.0180	0.0141	0.0376	-0.0122	0.0179
	(0.0319)	(0.0306)	(0.0309)	(0.0323)	(0.0315)	(0.0320)	(0.0323)
Foreign	0.0038	0.0088	0.0066	-0.0074	-0.0094	0.0314***	0.0015
	(0.0142)	(0.0130)	(0.0139)	(0.0144)	(0.0160)	(0.0112)	(0.0138)
SyFi	-0.0331	-0.0261	-0.0302	-0.0294	-0.0301	-0.0313	-0.0265
	(0.0306)	(0.0281)	(0.0302)	(0.0295)	(0.0299)	(0.0290)	(0.0301)
pc1	0.0011**	0.0015***	0.0007	0.0011**	0.0002	0.0014***	0.0010**
	(0.0004)	(0.0005)	(0.0004)	(0.0004)	(0.0004)	(0.0005)	(0.0004)
Constant	0.5643***	0.5170***	0.5851***	0.5909***	0.5317***	0.5212***	0.6515***
	(0.1081)	(0.0953)	(0.1223)	(0.1152)	(0.1060)	(0.1048)	(0.1268)
Observations	4,235	4,235	4,235	4,235	4,235	4,235	4,235
Number of banks	176	176	176	176	176	176	176
chi2	3026	3068	2833	3215	3206	3077	3246
chi2p	0	0	0	0	0	0	0
sarganp	0	0	0	0	0	0	0
hansenp	1	1	1	1	1	1	1
ar1p	6.99e-11	0	1.26e-10	9.02e-11	7.04e-11	7.40e-11	6.76e-11
ar2p	0.204	0.195	0.199	0.216	0.216	0.174	0.203
j	741	741	741	741	741	741	741

*** p<0.01, ** p<0.05, * p<0.1 ; robust standard errors in parenthesis.

interbank market, value such information by granting higher volume of interbank loans to the more transparent institutions.

The result obtained concerning transparency is also confirmed by the reserve ratio variables. Banks with higher level of reserve participate less in the interbank market because they are already able to satisfy capital requirements. The result is stable for each transparency component, except for regression involving corporate event transparency component. In the meantime, the results obtained confirm the lower borrowing positions of larger banks in terms of asset. Such institutions are likely to be more engaged in other types of funding but the systemic financial institutions status does not appear to significantly affect interbank positions. We expected the same results from foreign-owned bank, but it also appears non-significant. Our results do not allow us to conclude on the interbank positions of state-owned banks.

Banks involved in larger credit activity in terms of assets have a higher need of interbank funds in order to fulfil capital requirements. We tested for such hypothesis and it appears positively significant for each of the transparency component specification. Universal banks tend to have a higher deposit to liabilities ratio than investment banks. In our case, universal banks are less likely to rely on interbank borrowing to satisfy capital requirement since they can fulfil them with high deposit levels. The higher level of deposits to liabilities, the lower the interbank borrowing levels are. Ultimately, it appears that investment bank somehow rely more on interbank funding to satisfy capital requirements.

5. Robustness check

To assure the robustness of our results, we carry out a second set of regressions where we test, the impact of transparency variables on bank's net interbank position (*NMO*). It includes both the deposit and repo interbank activities of banks. The use of such variable allows us to capture all of the active interbank operation of each bank at each individual period. We expect the result to be close to the one obtained before because the share of interbank repo activity is significantly lower than the share of deposit operations. We maintained the constraint used before and presented in earlier sections.

The results of our second regression set are available in table 4. Overall, the findings are similar to the original specification. The results confirm also the active role of transparency over the monetary operations. The transparency variables, either the individual component or the global indicator, significantly and positively impact the net monetary operations. The reputation effect is still visible. Banks which are active on the interbank market the previous period are going to significantly be active at the current period. Well capitalized banks are also less likely to be active on the interbank market, reinforcing the idea which the interbank market is mainly used to fulfil capital requirements. Banks involve in more credit activity remains more attracted to interbank positions that more universal banks. Concerning risk profile and liquidity, the results are also qualitatively similar.

On the other hand, a few changes are visible. The ownership structure variables, in some specifications, appear significantly negatively impacting the volume of net monetary operations. Both foreign owned and government owned banks have significantly lower level of net monetary operations once we control the transparency indicators for financial information. This is explained by the fact that foreign banks can have an easier access to external funds (from headquarters and from other sources like stock market). A similar

explanation is possible for state-owned banks. Most of state owned banks are large, allowing them to attract funds from different sources

Table 3 Robustness check, Blundell-Bond regression net interbank operations

	(8)	(9)	(10)	(11)	(12)	(13)	(14)
			Independent Variable: net monetary operations				
TR_p	0.0143***						
	(0.0035)						
TR_S_p		0.1065***					
		(0.0205)					
TR_C_p			0.2073***				
			(0.0499)				
TR_F_p				0.0408***			
				(0.0087)			
TR_R_p					0.1088***		
					(0.0266)		
TR_board_p						0.1283***	
						(0.0245)	
TR_B_p							0.0721***
							(0.0145)
L.MNO	0.5595***	0.6631***	0.6534***	0.6672***	0.6550***	0.6561***	0.6540***
	(0.0361)	(0.0368)	(0.0364)	(0.0357)	(0.0344)	(0.0367)	(0.0368)
Capital/Asset	-0.1125	-0.2105**	-0.1689*	-0.2124*	-0.1714*	-0.2632**	-0.1873*
	(0.1387)	(0.1029)	(0.0977)	(0.1096)	(0.1004)	(0.1091)	(0.1027)
Reserve Ratio	-0.0699	-0.0903*	-0.1058***	-0.0974**	-0.0841	-0.1584***	-0.1125**
	(0.0451)	(0.0476)	(0.0388)	(0.0391)	(0.0533)	(0.0487)	(0.0496)
ROA	0.1236	0.1899	0.0262	0.1369	0.0859	0.1564	0.1181
	(0.2081)	(0.2296)	(0.1914)	(0.2152)	(0.2118)	(0.1962)	(0.2034)
N3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
LnA	-0.0403***	-0.0432***	-0.0430***	-0.0476***	-0.0396***	-0.0458***	-0.0446***
	(0.0084)	(0.0082)	(0.0100)	(0.0097)	(0.0096)	(0.0084)	(0.0091)
DA	-0.1910***	-0.1713***	-0.1454***	-0.1472***	-0.1492***	-0.1858***	-0.1582***
	(0.0262)	(0.0229)	(0.0249)	(0.0238)	(0.0224)	(0.0272)	(0.0195)
LA	0.1727***	0.1502***	0.1494***	0.1434***	0.1503***	0.1633***	0.1455***
	(0.0352)	(0.0304)	(0.0292)	(0.0315)	(0.0303)	(0.0310)	(0.0329)
State	-0.0069	-0.0246	-0.0246	-0.0438**	-0.0199	-0.0662***	-0.0360*
	(0.0306)	(0.0201)	(0.0194)	(0.0206)	(0.0190)	(0.0227)	(0.0208)
Foreign	0.0076	-0.0156	-0.0085	-0.0343**	-0.0358***	0.0140	-0.0188
	(0.0161)	(0.0106)	(0.0111)	(0.0149)	(0.0134)	(0.0101)	(0.0116)
SyFi	-0.0335	-0.0038	-0.0111	-0.0265	-0.0226	0.0005	-0.0079
	(0.0423)	(0.0280)	(0.0351)	(0.0392)	(0.0305)	(0.0299)	(0.0320)
pc1	0.0037***	0.0034***	0.0023***	0.0028***	0.0017***	0.0031***	0.0026***
	(0.0007)	(0.0006)	(0.0006)	(0.0007)	(0.0006)	(0.0006)	(0.0006)
imr	-0.0002*	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Constant	0.6842***	0.7258***	0.6955***	0.7958***	0.6527***	0.7624***	0.8398***
	(0.1456)	(0.1370)	(0.1626)	(0.1612)	(0.1596)	(0.1387)	(0.1693)
Observations	1,587	1,587	1,587	1,587	1,587	1,587	1,587
Number of banks	135	135	135	135	135	135	135
chi2	1214	1372	1227	1352	1260	1304	1322
chi2p	0	0	0	0	0	0	0
sarganp	0	0	0	0	0	0	0
hansenp	1	1	1	1	1	1	1
ar1p	3.29e-09	5.48e-09	3.17e-09	2.23e-09	5.64e-09	4.35e-09	5.74e-09
ar2p	0.237	0.395	0.241	0.295	0.343	0.261	0.301
j	640	670	670	670	670	670	670

*** $p<0.01$, ** $p<0.05$, * $p<0.1$; robust standard errors in parenthesis

6. Conclusion

The results of this article confirm the need of voluntary transparency to allow riskier financial institutions to obtain funds on the interbank market, main supplier of funds for Russian banks. The riskier banks choose to be more transparent, since transparency levels are positively correlated to the bank fundamentals in term of capital, liquidity and risk. It allows them to be able to attract a larger volume of interbank loans and deposits. The interbank sector has important contributions to the banking sector, and enhancing its functioning is crucial to the functioning of the whole banking sector. In order to be well functioning, it must provide sufficient liquidity for banks to operate and to be sound, in order to continue operating. It also exacerbates the risk of contagion in case of financial troubles. Therefore, it reinforces the need of transparency and the disclosure of information as a vector of market discipline.

The findings of this study are consistent with the empirical and theoretical literature which advocate for higher levels of disclosure and the literature emphasizing market discipline. But also provides one of the first evidence of the peer monitoring effect through the vector of information disclosure.

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Appendix

1. Transparency Indexes composition

Table A Transparency index composition

Component 1	Ownership and Group Structure
Q4	The identity of the largest shareholder
Q5	The number and identity of all shareholders holding more than 10%
Q11	Shareholding in the bank by individual senior managers
Q12	Shareholding in the bank by individual directors
Component 2	**Corporate procedures**
Q24	The existence of a review of last shareholders meeting (e.g., general presentation of voting results)
Q25	Detailed press releases covering last corporate events
Component 3	**Financial information**
Q27	The bank`s accounting policy
Q31	Annual financial statements according to an internationally recognized accounting standard (IFRS/U.S. GAAP) without notes
Q32	Notes to annual financial statements according to IFRS/U.S. GAAP
Q33	An independent auditors` report with regard to annual financial statements according to IFRS/U.S. GAAP
Q36	Disclosure of related-party transactions (RPTs): sales to/purchases from, payables to/receivables from related parties
Q37	Transactions with the companies with the same group
Q40	Interim financial statements according to an internationally recognized accounting standard (IFRS/U.S. GAAP)
Q41	Notes to such financial statements
Q42	Whether these financial statements are audited or at least reviewed
Q49	Whether the audit firm is a top-tier auditor
Q61	Indicators of concentration (industry, client/shareholder, insider, and so on)
Component 4	**Operational information**
Q66	Analysis of the bank`s risks (list of risks, their description, and the way they may affect the bank)
Q67	Risk management policy
Component 5	**Board and Management Information**
Q82	The list of board members (names/titles)
Q96	The list of senior managers not on the board of directors
Q97	The background of senior managers
Component 6	**Board and committee structures and procedures**
Q149	Majority of board is external
Q151	Board chairman is external
Q152	Board includes external members with relevant industry experience
Q153	Board includes external members with expertise in finance/audit
Q154	Board includes external members, except for executives of the bank, with expertise in strategic management
Q155	At least half of the board members possess expertise in these spheres
Q156	Existence of audit committee

2. First step equation results

Table B First step equation results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	TR	TR_shareholder	TR_corp.e	TR_fininfo	TR_risk	TR_board	TR_pca
efficiency	-32.6177***	-8.6043***	-1.2661	-13.0834**	-5.4529**	-4.2110	-7.9045***
	(11.5278)	(2.5522)	(1.7068)	(6.0947)	(2.2764)	(2.8649)	(2.7367)
L.N1	0.0330	0.0064	0.0016	0.0147	0.0024	0.0080	0.0077
	(0.0225)	(0.0049)	(0.0031)	(0.0115)	(0.0046)	(0.0057)	(0.0053)
L.npl_ratio	8.3750**	1.0522	0.7229	3.4242*	1.5191**	1.6565*	2.1600**
	(3.7961)	(0.7954)	(0.7244)	(2.0384)	(0.6990)	(0.9227)	(0.9146)
L.d2a	2.9525***	0.6965***	0.1667	1.1070*	0.3848*	0.5976**	0.7290***
	(1.0803)	(0.2531)	(0.2166)	(0.5783)	(0.2307)	(0.2511)	(0.2632)
L.lna	1.9783***	0.3102***	0.1695***	0.9281***	0.2843***	0.2862***	0.4873***
	(0.1682)	(0.0385)	(0.0316)	(0.0904)	(0.0404)	(0.0407)	(0.0401)
state_50	2.7955***	0.2936	0.1934	1.3761**	0.2637	0.6688**	0.6607***
	(1.0257)	(0.3375)	(0.2337)	(0.5857)	(0.2279)	(0.2930)	(0.1997)
foreign_50	1.6389	0.2362	0.0840	1.0111*	0.3912*	-0.0836	0.3770
	(1.1566)	(0.2624)	(0.1851)	(0.6020)	(0.2181)	(0.2108)	(0.2793)
pc1	-0.0616**	-0.0162**	-0.0033	-0.0287**	-0.0012	-0.0122*	-0.0138**
	(0.0259)	(0.0063)	(0.0043)	(0.0136)	(0.0060)	(0.0072)	(0.0062)
Constant	-30.5264***	-4.8346***	-2.5294***	-14.4211***	-4.2740***	-4.4672***	-8.8619***
	(2.8560)	(0.6442)	(0.5223)	(1.5335)	(0.6857)	(0.7004)	(0.6767)
Observations	4,840	4,840	4,840	4,840	4,840	4,840	4,840
R-squared	0.4491	0.2803	0.1933	0.3873	0.2778	0.2245	0.4660
Number of banks	179	179	179	179	179	179	179
p	0	0	1.84e-09	0	0	0	0

*** p<0.01, ** p<0.05, * p<0.1 Robust standard errors in parentheses