BOFIT Discussion Papers
14 • 2008

Anatoly Peresetsky

# Market discipline and deposit insurance in Russia


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Bank of Finland, BOFIT
Institute for Economies in Transition

BOFIT Discussion Papers
Editor-in-Chief Iikka Korhonen

BOFIT Discussion Papers 14/2008
29.9.2008

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ISBN 978-952-462-919-5
ISSN 1456-5889
(online)

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Suomen Pankki
Helsinki 2008

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Anatoly Peresetsky*

# Market discipline and deposit insurance in Russia

## Abstract

The paper presents a study of Russian banks' interest rates on household deposits during the formation period of the deposit insurance system. It is shown that market discipline weakened after deposit insurance was effectively in place.

Keywords: deposit insurance, market discipline, deposit interest rates
JEL codes**:** G21, G28, P37

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Anatoly Peresetsky

# Market discipline and deposit insurance in Russia

## Tiivistelmä

Tässä tutkimuksessa tarkastellaan venäläisten pankkien kotitalouksille tarjoamia talletuskorkoja ajanjaksona, jolloin Venäjällä otettiin käyttöön talletusvakuutusjärjestelmä. Kun talletusvakuutus on käytössä, talletuskorot eivät enää näytä reagoivan muutoksiin pankkien riskinotossa.

Asiasanat: talletusvakuutus, markkinakuri, talletuskorot

# 1 Introduction

Market discipline is comprised of depositors' punitive actions against banks for excessive risk taking (Berger, 1991). Depositors require high interest rates (incl. risk premia) from banks that pursue risky investment policies, or they simply withdraw their deposits. Introducing a deposit insurance system reduces depositors' risks but at the same time renders banks more inclined to raise their levels of risk-taking. The market-discipline hypothesis states that high interest rates are related to high-risk behaviour by banks.

Market discipline in the economy's banking sector is a fundamental pillar of the New Basel agreement (Basel-II). Market discipline puts pressure on the less efficient banks and hence could improve the efficiency of banking system.

Nier and Baumann (2006) present three conditions for effective market discipline: 1) depositors need to consider themselves at risk of loss if the bank defaults; 2) market responses to changes in the bank's risk profile need to have cost implications for the bank and its managers; and 3) the market must have adequate information to gauge the bank's riskiness.

Caprio and Honohan (2004) find that market discipline could be effectively realised in low-income countries, where depositor discipline is effectively in the hands of a small group of large depositors. This means that the information requirements for depositor discipline can be relatively easily satisfied. Moreover, in developing countries the bank supervision authorities are not as experienced as those in developed countries, so that bank supervision could be less effective. In such case, depositors in less developed countries are more concerned about banks' default probabilities, which could result in more effective realization of market discipline. They discuss four possible sources of market discipline in the banking system: depositors, debt holders, outside equity holders, and information specialists (e.g. rating agencies).

There is an extensive literature on market discipline in the banking sector and deposit insurance systems.

Hannan and Hanweck (1988) use data on US banks for the period 1980-1985. They find that interest rates on uninsured certificates of deposits depend on the variability of banks' returns on assets and levels of capitalization, both of which serve to gauge the likelihood of bank insolvency. These factors have impacts that are consistent with the market-

discipline hypothesis. Bank size is also significant, and its influence is consistent with the too-big-to-fail paradigm.

Martinez Peria, and Schmukler (2001) study experiences of Argentina, Chile, and Mexico during the 1980s and 1990s. They found that depositors discipline banks by withdrawing deposits and by requiring higher interest rates. Surprisingly, deposit insurance does not reduce market discipline in these countries, implying that none of the deposit insurance schemes were fully credible. This also shows that market discipline increases after a banking crisis, as depositors became more aware of the risk of losing deposits.

Demirgüç-Kunt and Huizinga (2004) consider two cross-country samples of banks from 30 to 50 countries (including Russia) in 1990-1997. They find that explicit deposit insurance lowers banks' deposit interest rates and renders interest rates less sensitive to bank risks. Thus deposit insurance is found to reduce the market discipline required by creditors. They found the bank-risk measures equity, profit, liquidity to be significant, with negative coefficients, in interest-rate regressions.

Some papers study how bank deposit insurance systems affect the likelihood of a systemic banking crisis. Demirgüç-Kunt and Detragiache (2002), for example, consider panel data for 61 countries in 1980-1997, a period that includes 40 bank crises. They conclude that explicit deposit insurance increased the likelihood of banking crisis, particularly where bank interest rates were deregulated and the institutional framework was weak. Also, that effect was found more pronounced when the insurance coverage was extensive and the deposit insurance scheme was administered by the government rather than private providers.

González (2005) examines a panel database of 251 banks in 36 countries in 1995-1999. He considers two bank risk measures: bank stock price volatility and the non-performing loan ratio. Both risk measures are found to be significantly higher in countries with deposit insurance. The presence of tighter regulations on bank activity and a robust legal system are shown to reduce the adverse effects of deposit insurance, a result consistent with Demirgüç-Kunt and Detragiache (2002).

Hoggarth et al. (2005) reach a similar conclusion on the impact of deposit insurance on market discipline, using probit regression for the probability of a banking crisis with a dataset covering 29 countries in 1994-2001. They find that, while unlimited protection for depositors appears to reduce the overall impact of a crisis on the economy, deposit insurance makes a weak banking system more susceptible to crisis. They state that deposit in-

surance could reduce the link between a bank's risk of default and its funding cost, creating an incentive for the bank to increase default risk at the expense of depositors or the deposit insurance fund.

The conclusion from these papers is that deposit insurance increases the probability of a banking crisis but at the same time reduces the expected loss from a crisis.

There are very few recent studies that examine market discipline in the Russian banking sector.

The paper of Karas et al. (2006) deals with market discipline in the Russian deposit market following the 1998 financial crisis. It considers all (nearly 1,400) Russian banks in the period of 16 quarters from 1999:1 to 2002:4. The main finding of the paper is that Russian depositors discipline their banks mainly by reducing the amounts of their deposits. Market discipline in demanding higher (real) interest rates is found to be less pronounced. Highly capitalized banks and banks with high returns on assets are shown to pay lower interest rates, and the effect of excess reserves on deposit rates is nonlinear. Karas et al. find support for the idea that excessively high interest rates are perceived by Russian depositors as a sign of poor bank quality.

Ungan et al. (2008) study the reaction of Russian depositors to excessive risk taking by large banks between 2000:1 and 2005:1. As in Karas et al. (2006), they find that Russian depositors discipline banks by withdrawing money from banks that take excessive risks. Depositors adjust the level of their funds in banks based on the banks' liquidity and capital adequacy. But the found that risk factors are not significant in demanding higher interest rates on deposits. They also concluded that the establishment of a deposit insurance system in 2004 has not yet been effective in influencing depositors' behaviour.

Unlike Karas et al. (2006) and Ungan et al. (2008), who use average implicit interest rates, calculated as the ratio of interest expenses to total deposits in the previous period, Peresetsky et al. (2007) use actual interest rates, as posted on bank websites. They use the ratio of quarterly bank deposit interest rate to prior-quarter bank financial indicators.

Peresetsky et al. (2007) study deposit interest rates suggested by Russian banks in 2004:1 to 2005:4, the exact period in which the deposit insurance system was being established in the Russian Federation. They conclude that market discipline plays a role in the setting of deposit interest rates: Russian depositors require higher interest rates from banks with riskier financial behaviour. This discipline seems stronger than in the developed coun-

tries. Thus it appears that, in a country with a less developed and less reliable bank regulation system, depositors have to take the job of market discipline into their own hands. It could be that Karas et al. (2005) and Ungan et al. (2008) failed to find such market discipline because they used implicit interest rates. A weakening of market discipline after establishment of a deposit insurance system was also found.

The data used in Peresetsky et al. (2007) paper are somewhat problematic. In the sample of only 26 banks, only one quarter contains both banks included in and excluded from the deposit insurance system. Moreover, in 2004:1 and 2004:2, no bank in the sample was included in the deposit insurance system, and in 2004:4, 2005:3, and 2005:4, all banks in the sample were included in the system. This suggests a possible multicollinearity problem, which is why the results of these papers need to be verified using more rich data on actual deposit interest rates.

The objective of the present paper is to accomplish a more detailed analysis of the impacts of establishing a deposit insurance system on market discipline in the Russian Federation. Unlike papers mentioned above, we use monthly observations on deposit interest rates for about 100 Russian banks in the period January 2004 to November 2006, which includes the period of establishment of the deposit insurance system. The process of admitting banks to the deposit insurance system was very speedy: more than half of banks were admitted during one quarter, which explains the expected advantage of using monthly rather than quarterly data.

# 2 Data

The Deposit Insurance Agency (DIA) was established in Russian Federation in January 2004, and in September 2004 the first group of banks was admitted to the Deposit Insurance System (DIS). To be admitted to the DIS a bank must satisfy certain solvency requirements (see DIS, 2004), formulated by DIA and the Central Bank of Russian Federation (CBR). Since DIA was established, only banks admitted to DIS have had the right to take household deposits.

When DIS was started in September 2004, all deposits up to 100,000 roubles were 100% insured. The coverage was expanded in August 2006 by adding a 90% reimbursement of total deposit amounts in excess of 100,000 roubles and up to a maximum of

190,000. The coverage was expanded again in March 2007, when the upper limit for reimbursement was raised to 400,000[1]. Deposits in different banks are covered separately.

The process of admitting banks to DIS was continued in 2005 and as of 1 January 2008, 934 Russian banks were included in DIS. The dynamics of that process are presented in Fig.1[2].

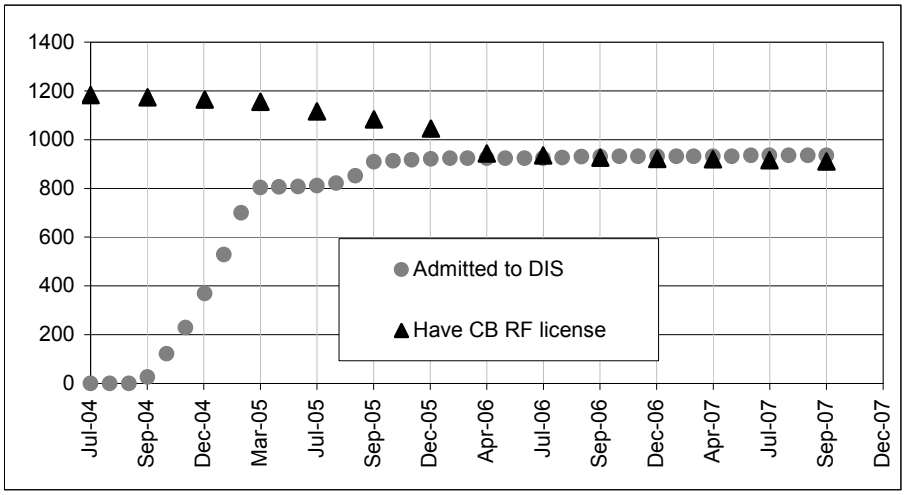


Fig. 1. Number of banks with CBR license for household deposits and number of banks admitted to DIS. (source: DIA, www.asv.org.ru)

In this paper we study interest rates on 6-month fixed-dollar-amount deposits with interest paid at maturity. The data cover the period January 2004 − November 2006, which includes the establishment of DIS (see Fig.1). The data constitute an unbalanced panel with 687 observations on 105 banks. Most of the data are from the site www.banki.ru and are completed with data from certain bank websites. The corresponding monthly bank financial indicator data are provided by the Mobile information agency.

Interest rates on the deposits remained relatively stable (about 6.5%) during the period 2004:2 − 2006:4. Fig.2 presents quarterly average interest rates for 6-month dollar deposits and their 95% confidence boundaries.

[1] On 5 June 2008, 400,000 rubles was equivalent to EUR 10,888.
[2] The negative difference between number of banks with CB RF license for household deposits (906 on 1 Jan 2008) and number of banks in DIS (934) reflects banks' losses of CB DF license due to default.

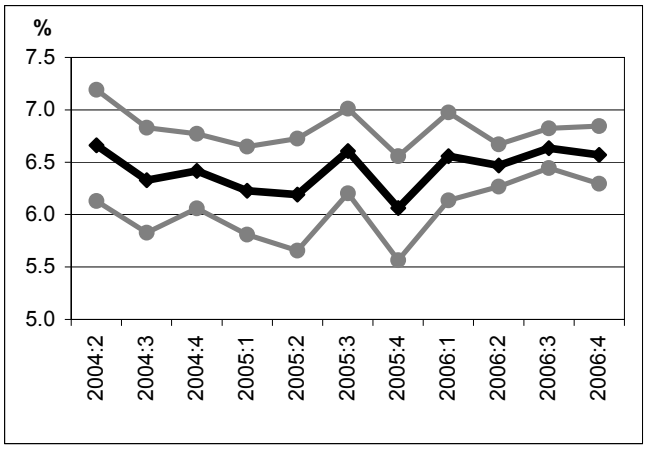


Fig. 2. Quarterly average interest rates on 6-month dollar deposits and 95% confidence boundaries

Fig.2 shows some reduction in the variation of interest rates paid by banks during the period of DIS formation. To compare these two processes in terms of convergence of interest rates and DIS formation, Fig. 3 presents the numbers of banks admitted to DIS and interest rate variations among the banks (measured as standard deviation of banks' quarterly average interest rates).

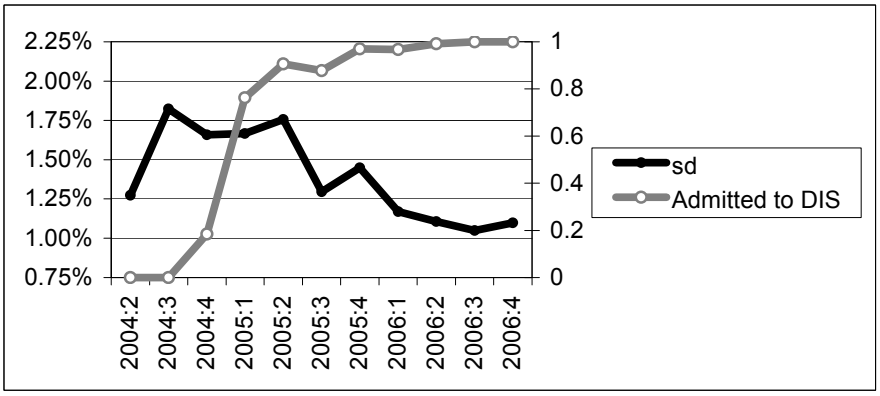


Fig. 3. Variation of interest rates (*sd*, LHS, %) and share of banks in total sample admitted to DIS (RHS).

Fig. 3 illustrates the tendency toward decreasing variation of interest rates paid by banks, which began in 2005:2, when most banks were already admitted to DIS (compare Fig.1, for the whole banking system). Hence one can say that the variation of deposit interest rates decreased with the formation of DIS, which could be interpreted as an easing of the depositor-control of banks, i.e. a weakening of market discipline.

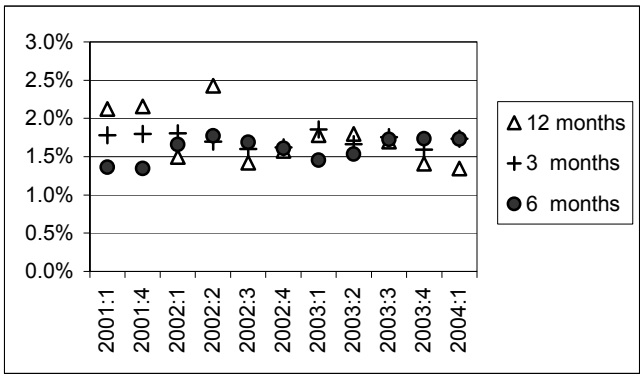


Fig. 4. Standard deviation of household dollar deposit interest rates

Remarkably, that trend was not observed before 2005. In Fig. 4 (same as Fig. 1 in Peresetsky et al., (2007)) the variation in dollar-deposit interest rates (for 3 different deposit maturities) is presented for the period 2001:1 to 2004:1.

The following bank financial indicators (usually included as explanatory variables in bank risk models such as default models and rating models), are used in the regressions below:

- Size of bank, as logarithm of total assets (in thousand roubles). It is now generally accepted that, due to wide variations in bank size, the log bank size performs better in regressions. Large banks are better able to diversify risks and hence are more credible. Such banks have access to cheaper money from other sources (e.g. from interbank credit market and foreign banks) and so can pay lower interest rates to private depositors. Depositors in turn are likely to see a large bank as more reliable and so will accept lower deposit interest rates.
- Equity-to-total assets ratio, bank capitalization, as a measure of bank soundness - ability to survive shocks. A private depositor considers a highly capitalized bank to be more credible and accepts a low deposit interest rate. There could actually be a reverse effect. A bank with excessive capitalization could be less efficient. This ratio is close in spirit to the CBR's H1 standard. The CBR sets a lower boundary for the H1 standard, and the most efficient banks can be expected to keep their H1 close to that boundary. Less efficient banks, in contrast, must seek to attract depositors by offering higher deposit interest rates. If the latter tendency is stronger than the former, we can expect a positive sign on the Eq/As coefficient in a regression.

- Loans to nonfinancial institutions-to-total assets ratio. Especially in Russia, loans to firms could be considered risky by depositors and so they may require a higher interest rate as a risk premium. The reverse effect is also sometimes observed: a bank with successful relations with firms could consider retail business less important and hence offer low interest rates to private depositors.
- Reserves for possible losses on loans to nonfinancial institutions as percentage of such loans. This indicator is a measure of loan quality. Reserves are set aside according to degree of loan risks; the higher the ratio, the riskier the bank loan portfolio. A positive sign on the coefficient is expected, since depositors consider banks with high reserves-to-loans ratios as risky.

Descriptive statistics on bank financial indicators for the sampled banks are presented in Table 2 in the Appendix.

# 3 Model and results

To determine which bank financial indicators are significant for deposit interest rates and influence of admitting a bank to the DIS the following model is considered:

$$r_{it} = included_{it}\gamma + (1 - included_{it}) \cdot x'_{it}\beta_1 + included_{it} \cdot x'_{it}\beta_2 + q'_t\delta + \varepsilon_{it}. \qquad (1)$$

Here $r_{it}$ is the interest rate on 6-month dollar deposits at bank *i* at time *t*. The deposits fixed in amount and interest is paid at maturity. If in bank *i* at time *t* there were several deposits of that kind, differing in other conditions such as free plastic card etc., $r_{it}$ is the average interest rate); $included_{it}$ is a dummy variable that equals 1 if the bank *i* at time *t* already was admitted to DIS, and zero otherwise; $x_{it}$ is the vector of financial indicators of bank *i* at time *t*; $q_t$ is the vector of control variables describing variations in macroenvironment at time *t* (incl. intercept). Thus, $\beta_1$ reflects the impact of bank indicators *before* the bank was admitted to DIS, and $\beta_2$ reflects the impact of bank indicators *after* bank was admitted.

Results of the estimations of equation (1) for 6 different choices of control variables, $q_t$, are presented in Table 1. In model 1, $q_t$ includes only the intercept; in model 2

it includes all the yearly dummies; in model 3 it includes all the quarterly dummies; in model 4 it includes all the monthly dummies (i.e. maximum control for macro-environment); in (more parsimonious) model 5 $q_t$ includes the intercept and *rateav_q*$_t$ (average quarterly interest rate for all banks in the sample at time $t$ ); finally, model 6 is similar to the model 5 except that, instead of a quarterly average it includes *rateav_m*$_t$ , which is the monthly average interest rate at month $t$ for all banks in the sample. Respectively, the dimensions of vector $\delta$ are 1, 3, 12, 34[3], 2, and 2.

All models in table 1 are estimated as panel-fixed-effect models. Tests indicate that this model is preferable to the pooled or random effect models. Results from the pooled model differ significantly from the presented estimates (more variables are significant), which is another sign in favour of the fixed-effect model.

Table 1. Interest rates models

| Model | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| Included | –0.376 | –0.239 | –0.326 | –0.419 | –0.286 | –0.306 |
| | (0.62) | (0.62) | (0.63) | (0.65) | (0.62) | (0.62) |
| ln(Total assets), before | –0.157 | –0.276** | –0.174 | –0.175 | –0.245** | –0.205* |
| | (0.11) | (0.14) | (0.16) | (0.17) | (0.11) | (0.11) |
| Equity /Total assets, before | –2.026** | –2.134*** | –2.006** | –2.159** | –2.089*** | –2.052** |
| | (0.80) | (0.81) | (0.82) | (0.85) | (0.80) | (0.80) |
| Loans to nonfinancial institutions / Total assets, before | 0.984** | 0.965** | 1.026** | 1.044** | 0.999** | 0.991** |
| | (0.44) | (0.44) | (0.45) | (0.46) | (0.44) | (0.44) |
| Reserves for losses / Loans to nonfinancial institutions, before | 1.465** | 1.368* | 1.454** | 1.519** | 1.503** | 1.500** |
| | (0.69) | (0.70) | (0.73) | (0.75) | (0.69) | (0.69) |
| ln(Total assets), after | –0.088 | –0.208 | –0.102 | –0.0978 | –0.177 | –0.137 |
| | (0.10) | (0.14) | (0.16) | (0.16) | (0.11) | (0.11) |
| Equity /Total assets, after | –0.759 | –1.090 | –0.768 | –0.748 | –0.928 | –0.852 |
| | (1.01) | (1.04) | (1.04) | (1.06) | (1.01) | (1.01) |
| Loans to nonfinancial institutions / Total assets, after | –0.362 | –0.414 | –0.356 | –0.386 | –0.351 | –0.366 |
| | (0.37) | (0.37) | (0.39) | (0.40) | (0.37) | (0.37) |
| Reserves for losses / Loans to nonfinancial institutions, after | –1.110 | –1.171 | –1.058 | –1.061 | –1.046 | –1.054 |
| | (0.82) | (0.82) | (0.85) | (0.87) | (0.82) | (0.82) |
| Yearly dummies | | + | | | | |
| Quarterly dummies | | | + | | | |
| Monthly dummies | | | | + | | |
| Quarter average | | | | | + | |
| Monthly average | | | | | | + |
| R-square | 0.06 | 0.06 | 0.08 | 0.11 | 0.07 | 0.06 |

*, **, *** – significant at 10, 5, 1% levels. Standard errors in brackets.

[3] The data for the March 2004 are missed.

It is no surprise that model 4 gets the highest goodness-of-fit measure ($R^2$), as it entails the maximum control for macro-environment. All models get fairly low determination coefficients, $R^2$, as expected, since interest rates of course depend on many other (sometimes even subjective) factors.

Consider first the before-part of table 1, which contains estimates of $\beta_1$ coefficients in equation (1). All four bank indicators are significant in the six models. The coefficient estimates are very close to each other in all the models. The coefficient signs correspond to the market discipline hypothesis. Indeed, a negative coefficient for the size variable means that depositors trust more in big banks, according to the too-big-to fail paradigm. Also, it is expected that in a crisis situation big banks are more likely to obtain support from the government (state banks) or from industry (e.g. Gazprom). A bank with high capitalization is able to cover unexpected losses, which explains why depositors presume such banks to be sound and results in a negative coefficient for capitalization. A positive sign on the coefficient for Loans to nonfinancial institutions means that depositors in Russia consider such loans as risky assets and require higher interest rates. Reserves for possible losses are determined according to the risk of loans; hence the Reserves for possible losses-to Loans to nonfinancial institutions ratio is a measure of loan portfolio quality and reflects the quality of bank management, so that depositors require high interest rates from banks with high values of that ratio.

Thus market discipline is found before a bank is admitted to DIS. All $\beta_1$ are significant and have the "correct" signs according to the market discipline hypothesis. In contrast, the $\beta_2$ coefficients are not significantly different from zero, indicating a lack of market discipline (at least in the framework of our model) after the bank is admitted to DIS.

From this, one can conclude that the establishment of deposit insurance weakened market discipline in the Russian banking system.

Coefficient $\gamma$ is negative, which could be consistent with decreasing risk of depositors after the bank is admitted to DIS. However, that coefficient is not significant in all the models. There are two tendencies here. On one hand, depositor's risks decrease after a bank is admitted to DIS, since the deposits are then insured. On the other hand, a part of the bank's risk is shifted from bank to DIA, and bank may then be inclined to take on additional risk. Seemingly, the two tendencies offset each other.

# 4 Conclusion

In this paper we study household deposit interest rates in the Russian Federation during the period of transition of the banking system to deposit insurance. Using monthly data on 6-month dollar deposits, we find that market discipline weakened after the establishment of deposit insurance. Obviously, that could result in a higher probability of banking crisis.

This finding is consistent with results obtained by other researches (see, e.g., Demirgüç-Kunt, Huizinga, (2004)). In contrast to the Martinez Peria, Schmukler (2001) paper, we found that Russian depositors trust the state deposit insurance system to a greater extent then do depositors in the three Latin America countries.

Recall that - according to the Demirgüç-Kunt, Huizinga, (2004), González, (2005), and Hoggarth et al., (2005) papers - establishment of a deposit insurance increases the probability of a banking crisis but reduces the expected loss therefrom, since, with deposit insurance, the default of one bank is less likely to lead to a loss of depositors' confidence in the whole banking system.

*Acknowledgements*

I am gateful to Alexandr Karminsky, Sergei Golovan, Selcuk Caner, and to participants in seminars at Bilkent university (Ankara), New Economic School, CEMI RAS (Moscow), and the Third Bachelier colloquium on mathematical finance and stochastic calculus (Metabief) for useful discussions, and to Mikhail Zlobin for research assistance.

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# Appendix

Table 2. Descriptive statistics

| Variable | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|
| ln(Total assets) | 16.89 | 1.79 | 12.29 | 21.92 |
| Equity /Total assets | 0.162 | 0.091 | 0.063 | 0.592 |
| Loans to nonfinancial institutions / Total assets | 0.549 | 0.145 | 0.033 | 0.907 |
| Reserves for losses/ Loans to nonfinancial institutions | 0.090 | 0.072 | 0.005 | 0.584 |

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