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AN ANALYSIS OF RATINGS OF RUSSIAN BANKS

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An Analysis of Ratings of Russian Banks¹

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Abstract

Since the recent financial crisis, both the Russian business community and foreign investors have started to make more and more use of ratings of the reliability of Russian banks, i.e., their ability to meet interest and repayment commitments to the investors. In response to this, the number of rating agencies has increased over the past few years. In this paper, existing ratings are analyzed and compared using ordered probit models that explain bank ratings from bank characteristics such as size indicators and financial ratios characterizing profitability, or default risk on loans given. Moreover, on the basis of a survey among financial experts, models for expert ratings are constructed and results are compared to those for the agency ratings.

We find that agency and expert ratings of virtual banks are largely in line with each other, but there are also some differences. For example, liquidity measures are important for agency ratings but insignificant for the expert ratings. Moreover, we find some surprising differences between expert ratings of real banks and expert ratings of virtual banks. While overdue loans are important for the virtual banks, they play no role in either the agency ratings or the expert ratings of real banks. An explanation may be that banks manage to mask the actual number of overdue loans.

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1. Introduction

Since the financial crisis in 1998, the development of the Russian economy and the expansion of financial interconnections between banks and enterprises have led to an increased interest in the ratings of the creditability of banks and enterprises in Russia, i.e., their ability to meet interest and repayment commitments to its investors.³ Bank ratings have become particularly widespread, and the number of rating agencies publishing ratings for Russian banks steadily continues to grow. One explanation for this is the high risk of operations in the Russian financial markets. Before the crisis, many large banks were considered “immortal.” Nevertheless, what happened in the banking system after August 1998 has shown that, in unstable economic conditions, the size of a commercial bank is not an absolute guarantee for its reliability or stability. More than half of the twenty largest Russian banks ceased to exist or lost their position in the market. Companies or individuals who intend to make a decision about the collaboration with a particular bank have become aware of the issue of bank reliability and now rely on bank ratings by professional agencies much more than before.

In this study, we analyze and compare the ratings published by several agencies. Characteristics of the banks such as size indicators and financial ratios are used to explain the ratings given by the most important agencies. Following the work of Kaplan and Urwitz (1979) on corporate bond ratings, we use ordered probit models to explain the rating, which is always a categorical variable with six or seven ordered possible outcomes. While many empirical studies on corporate bond ratings in general exist, only few look at ratings of companies in one specific industry. The topic of our study is probably most related to Mar Molinero, Apellaniz Gomez and Serrano Cinca (1996), who look at bond ratings of Spanish banks. They focus on one rating only, while we estimate and compare models for several ratings published by different agencies. As shown by Morgan (2002), there is a relation between the diversity in ratings in a certain sector and the difficulty of characterizing the risks of the firms. This explains his finding that the banking industry in the US is – together with the insurance industry - one of the industries with the largest diversities in the two main ratings (Moody’s and S&P). In the Russian banking sector, the risks are probably larger and harder to observe, but the ratings of the various agencies also seem to be more fundamentally different in the sense that they have their own (implicit) definition of what constitutes bank reliability or creditability. As a consequence, differences between the various ratings are sometimes substantial, and it is interesting to analyze what drives these differences.

The main methodological novelty of our study compared to many studies on bond ratings, is that apart from the ratings given by professional agencies, we also analyze the results of a survey among experts working at different Russian banks. These experts have first been asked which criteria they consider most important for bank reliability. Second, each of them has rated a number of existing and well-known Russian banks. Third, they have evaluated a number of virtual banks that were only described in terms of their scores on a selection of important reliability indicators. The analysis makes it possible to address a number of issues of interest. First, the data on the professional ratings can be used to investigate whether the agencies use the same published reliability criteria with the same weights or not, and to which extent their ratings are based

upon publicly available data of bank activity, rather than private and often qualitative, non-financial or subjective information such as management strategy, business plan, etc.. The latter is also the main motivation for the Mar Molinero et al. (1996) study. Second, it is interesting to compare the ratings of the agencies with ratings given by experts working in the banks themselves. Third, comparing expert evaluations of existing banks and virtual banks can give insight in the weight that experts give to the public information provided by the existing banks that may be subject to reporting bias, compared to the weight they would give to the same information for a virtual bank, where such reporting biases do not play a role. All this seems highly relevant also in an international context, relating to the new Basel agreement that sets new standards for the credit requirements for banks with less mechanical rules than before (see Basel Committee on Banking Supervision (2000, 2001) and the special issue of the *Journal of Banking and Finance* edited by Altman (2001)). Ideally, an objective rating as the one constructed by “averaging” over a panel of independent experts, could be the basis for a common standard of bank reliability.

This paper is organized as follows. In Section 2, a brief sketch of the recent developments and the current state of affairs of the Russian banking system is given. Section 3 gives an overview of existing ratings for Russian banks and describes the data on ratings that will be used in the empirical analysis. In Section 4, a set of bank characteristics is described that are considered relevant to explain the ratings. The empirical models will use subsets of these seventeen variables. Section 5 describes the set up of the expert survey and the data set obtained from this survey. Section 6 compares the estimated models for the published ratings and for the ratings given by an average expert in the survey to existing and virtual banks. Section 7 concludes.

2. The Banking Sector in Russia

The Russian Central Bank and the government ratified the medium-term (5 years) plan “The strategy of development of the bank sector of Russian Federation” in December 2001,⁴ stating a significant increase in bank reliability as one of the main goals of bank development. The strategy aims at increasing the role of the banking sector in the development of the Russian economy. It also should lead to gradual convergence of the characteristics of the Russian banking sector to those in countries that, in terms of the level of economic development, are leading the group of countries with a transition economy. It is foreseen that the ratio of banking sector assets to GDP can reach 45 to 50%. The ratio of capital of the banking sector to GDP should reach 5 to 6%, and the target for the ratio of credits to the real sector of the economy to GDP is 18 to 20%. This implies that banks need to attract investments and should increase their capital. Preparations for joining WTO will lead to more competition in the market of banking services. This, in turn, will make banks more interested in their position in the ratings, as one of the components of transparency and openness.

³ Creditability and reliability will be used as synonyms.

⁴ See the Statement of the Government of the Russian Federation and the Central Bank of the Russian Federation of December 30, 2001 “On the strategy of development of the banking sector of the Russian Federation” (http://www.cbr.ru/today/publications_reports/print.asp?file=strat_2002.htm).

The Association of Russian Banks (ARB) sees the problem of interrelations between banks and enterprises as one of the most important problems of the Russian banking sector.⁵ The needs for producer credits are not entirely satisfied. In 2000, the Russian economy turned from negative to positive growth. In the same year, the amount of credits given by banks to the real sector of the economy increased substantially. In November 2000, total enterprise debt on credits was 654 billion rubles with an increase of 47% in one year. Banks reduced interest rates and gave producers more access to their funds. Table 1 presents data on the dynamics of the main indicators of the development of the Russian banking sector from 1998 until 2002.⁶

Table 1. Main indicators of development of the Russian banking sector in real terms compared to July 1, 1998 (in %)

<i>Indicator</i>	<i>1/07/98</i>	<i>1/04/99</i>	<i>1/04/02</i>
Aggregate assets of banking sector	100.0	58.3	106.8
Banking sector capital	100.0	26.8	114.7
Credits to the real sector of the economy including unsettled debts	100.0	57.1	147.1
Deposits of private individuals	100.0	47.7	96.5
Funds accumulated from enterprises and organizations	100.0	84.3	148.3

Still, to reach stable economic growth the size of credits to the real sector of the economy should be increased. Well-functioning enterprises should not be denied the funds for production activity. One reason why the size of credits is not sufficient is in the enterprises themselves: 40% of them are unprofitable and the majority of them are not sufficiently remunerative. Such enterprises cannot count on bank credits because of too much credit risk. Many of these enterprises have low quality of management, with business-plans of investment projects that do not meet the banks' requirements.

The August 1998 crisis showed that the development of the Russian economy was closely connected with the state of the financial system. Stable and reliable Russian banks investing in the real sector can provide credits to the enterprises that need investments. In turn, the enterprises feel a considerable need for full and adequate information about banks in order to select a reliable partner. It also argued that banks could only survive by turning to the real sector instead of speculating on financial markets. See Tarasov and Zakharov (2000). Banks that give credits to firms have experience with industry and know the credit history of the firms they work with. These banks typically also provide financial management services to the firms and take part in designing business plans, so that the relation is beneficial to both bank and firm. As a result, the average default risk is lower than the risk of indirect and speculative investments through the financial

⁵ See two letters of the Association of Russian Banks to the Prime Minister of the Russian Federation M.M. Kassyanov signed by ARB President S.E. Egorov: February 13, 2001 № A-01/13-99, and September 4, 2001 № A-01/1-485.

⁶ Source: Report of Prime Deputy Chairman of the Central Bank of Russian Federation A.A.Kozlov at the XI International Bank Congress (Saint-Petersburg, June 6, 2002)

markets. This suggests that the extent to which banks are active in the real sector is crucial for their reliability. One of the specific aims of analyzing the ratings is to determine whether or not the existing ratings indeed depend on this. Moreover, we will also focus on the importance that the experts attach to this.

3 Ratings of Russian Banks

The ratings of Russian banks published on a regular basis in 2001 can be divided into several categories. The first category actually consists of rankings rather than ratings, i.e., lists of banks ordered according to some financial indicator or index. A drawback of such a list is that only one indicator is used, usually assets, shareholder equity, or another indicator of size. A typical example is the traditionally published list of banks ordered according to total liabilities. Some banks manipulate their position in this ranking by creating so-called “bubbles” in their balance sheets, increasing their liabilities to between 1.5 and 3 times the value of their assets, for example by adding virtual transactions between their own branches. To prevent this type of manipulations, many rankings now exclude loans and debts to own branches. Rankings are published each quarter by the agency Interfax (publishing the “Interfax-100” list of the 100 largest banks) and by the journal “Money” (200 largest Russian banks). Monthly rankings are published by the journals “Profile” and “Company.” Still, as the recent crisis has shown, the size of a bank is not an absolute guarantee for its reliability, limiting the value of these rankings.

The second category consists of so-called mixed ratings (see Olenev, Karminsky and Astrelina, 1999). These are lists of banks ordered according to an indicator that combines several bank characteristics that affect bank reliability. Examples are the ratings published by the journal “Profile” and the agencies Ratebank (rating of large banks in Moscow and the Moscow region) and IA “Mobile.” A mixed rating can be converted into a usual rating on (for example) a five-point scale by defining thresholds for the indicator and grouping banks accordingly.

The third category of ratings consists of classifications into a few categories on the basis of evaluations of the financial performance. The categories are usually with letters, figures, and signs “+” and “-”, for example, A1 or BB+. Most international rating agencies such as Standard & Poors’, Fitch IBCA, and Moody’s use this type of classification. Unfortunately, these international agencies evaluate only very few Russian banks. In Russia, the IC “Rating” agency and the “Expert” journal publish such ratings.

The ratings above can be divided into expert and distant ratings (see Olenev et al., 1999). In the expert approach, a rating agency acquires access to bank documents and analyzes both financial and non-financial information. Such ratings rely on information that is not publicly available. The data used in constructing such a rating may not always be up to date at the moment when the rating is published. Constructing this type of rating requires significant costs and effort, for inspecting the organization, processing the accumulated information, etc. Examples are the ratings issued by international agencies such as Standard & Poors’, Fitch IBCA, and Moody’s and ratings of the Russian agencies RA “Interfax” and EA-Rating.

On the other hand, distant ratings are typically constructed using publicly available financial information only. Examples are the ratings of the journals “Profile” and “Expert” and of the agencies “Mobile” and

IC “Rating”. Distant ratings can be divided into open ratings, for which the formula and algorithm are published, and closed ratings, which use agency expert evaluations, built on public information. The rating of “Profile” is open; the exact formula is published and everyone could replicate the calculations. The ratings of “Expert” and IA “Mobile” are neither open, nor completely closed. Some information about the methodology is published but not the details of the algorithm. An example of a completely closed rating is that of IC “Rating.”

In October 2001, there were nine published ratings of Russian banks: the ratings of the agencies Moody’s, Standard & Poor’s, Fitch IBCA, “RusRating”, “Ratebank”, IC “Rating”, and IA “Mobile” and of the journals “Expert” and “Profile”. Ratings of the international agencies Moody’s, Standard&Poor’s, and Fitch IBCA and the rating of the Russian agency IC “Rating” are classifications of banks into several reliability groups. Table 2 presents the pair-wise Spearman rank correlations for most of these ratings. The ratings of Moody’s and Standard & Poor’s are not included since they evaluate only very few Russian banks. The table shows that most of the ratings are positively correlated, suggesting that agencies at least to some extent use the same evaluation criteria. Size and significance level of the correlation coefficients vary substantially. The correlations between “Expert”, IC “Rating” and IA “Mobile” are all quite strong. On the other hand, none of the correlations with the rating of “Profile” is significant at the 5% level.

Table 2. Spearman rank correlations

	Number of banks rated	RusRating	Ratebank-1	Ratebank-2	IC “Rating”	IA “Mobile”	Fitch IBCA	Profile
Expert	59	0.55 (0.03) 16	0.56 (0.01) 20	0.51 (0.00) 30	0.74 (0.00) 43	0.80 (0.00) 58	-0.05 (0.87) 13	-0.15 (0.32) 49
RusRating	20	1	0.52 (0.23) 7	-0.13 (0.75) 9	0.09 (0.76) 14	0.69 (0.00) 19	0.35 (0.56) 5	0.02 (0.95) 19
Ratebank-1	19		1	... (...) 0-	0.67 (0.01) 15	0.38 (0.11) 19	0.13 (0.76) 8	0.43 (0.07) 18
Ratebank-2	38			1	0.51 (0.01) 26	0.52 (0.00) 29	0.45 (0.55) 4	0.11 (0.60) 24
IC “Rating”	115				1	0.72 (0.00) 51	0.93 (0.00) 8	-0.24 (0.14) 39
IA “Mobile”	117					1	0.35 (0.21) 14	-0.21 (0.08) 70
Fitch IBCA	15						1	0.25 (0.44) 12
Profile	90							1

Source: Original journals and websites where ratings are published. The second column contains the number of banks in each rating. Other columns contain Spearman rank correlation coefficients with *p*-values (in parentheses) and the number of banks rated by both agencies. The rating of Ratebank agency is presented in two parts: Ratebank-1 (largest banks) and Ratebank-2 (large banks).⁷

In the empirical analysis, we will focus on four ratings of Russian agencies: ratings of the journals “Expert” and “Profile” and the agencies IA “Mobile” and IC “Rating”. These are the Russian bank ratings that are most well-known and used by investors, on a number of banks that is sufficient for the empirical analysis. IC “Rating” divides banks into six groups: A3 – highest reliability, A2 – very high reliability, A1 –

⁷ There was not enough information to merge these two ratings into one as was done for “Expert”.

high reliability, B3 – high enough reliability, B2 – medium reliability, B1 – satisfactory. The methodology of constructing the rating is closed; the agency only indicates that expert opinions are used in addition to numerical (public) information.

The journal “Profile” publishes a reliability rating of large, medium and small banks. This is an ordered list of banks sorted by the evaluation coefficient of each bank’s creditability. This coefficient is calculated using the formula of V. Kromonov, a rather complicated formula involving several financial ratios and other bank characteristics. See “Methodology of the calculation of bank reliability rating,” Profile, 20 (242), 28 May 2001.⁸

The rating of IA “Mobile” is the Bank’s Dynamic Financial Stability Rating (RDFS; see Karminsky and Petrov, 2000, and Petrov, Astrelina, Berezinsky, and Belyaev, 2001, for details on the methodology). This is an open rating with a monthly update, which also takes into account the bank’s dynamics and the relative position of the bank compared to other banks. It is constructed on the basis of internal and external indicators. The internal indicators characterize the quality of the bank’s activities and the functional stability of the bank in dynamic terms. The external indicators reflect how the bank’s position in the Russian banking system evaluates during a year. Combining the internal and external indicators gives the value of the RDFS, which is the final result of processing of a multi-dimensional set of pieces of analytical information that arrive during the year (see Karminsky and Petrov, 2001).

Originally the ratings of the IA “Mobile” agency and “Profile” were presented as ordered lists of banks, sorted by the evaluation coefficient of bank reliability in the case of “Profile” and by value of RDFS in the case of IA “Mobile”. To make them comparable to other ratings, the orderings were transformed into categorical ratings, using thresholds chosen by expert opinion.

The rating of the journal “Expert” is a classification of banks into groups of similar financial stability. It is based on weighting indicators of sufficiency of capital, liquidity, quality of assets, profitability, and evaluation of management. Banks are divided into homogeneous groups according to size and type of activity. The rating of each bank is determined by its financial stability coefficient compared to the stability coefficients of other banks in the same group. Originally, “Expert” provided separate ratings for very large and for large banks in Moscow. To get a rating with a sufficient number of banks for analysis, these two ratings were combined into one rating. The procedure for doing this was simple: very large banks get their original rating, whereas large banks get new ratings which are two categories below their original rating. This adjustment is justified by the fact that, when a “large” bank grows and in the next time period falls into the “Expert” set of “very large” banks, the rating of this bank usually worsens by two categories. Since each of the original “Expert” ratings divided banks into four reliability groups, the merged rating has six reliability groups.

An interesting issue is the stability of ratings over time. For the ratings that existed already in the last quarter of 2000, the rank correlations between the ratings of each bank at two points in time are presented in Table 3. The table shows that the stability of the three ratings is similar.

⁸ See <http://www.profil.orc.ru/archive/n242/text6.html>

Table 3. Yearly Spearman rank correlations over time

“Expert”, December 2000 – December 2001	0.71
IC “Rating”, November 2000 – November 2001	0.76
“Profile”, October 2000 – October 2001	0.71

4 Indicators of Bank Performance

The explanatory variables in the ordered probit models explaining the ratings are a subset of 17 indicators of bank activity that are a priori considered to be potentially relevant for bank creditability. The set of 17 characteristics is presented in Table 4. Underlying financial indicators used to construct these variables are explained in the Appendix 1. We first briefly describe each of the 17 indicators and their expected effects on bank reliability. These indicators include the same dimensions of bank rating determinants found by Mar Molinero et al. (1996) and also the factors determining bankruptcy identified by Kolari, Glennon, Hwan Shin and Caputo (2002). In addition, some factors that are particularly relevant for the situation in Russia are taken into consideration.

Shareholders’ equity and assets are indicators of the size of a bank, which is commonly considered as one of the most important characteristics in determining bank reliability. The larger the bank, the more reliable it can be expected to be. The two indicators are strongly correlated. Only equity will be used in the regressions that we present, since it is the more significant one in all the models. Equity appears to be significant with the expected positive sign in the models for all four ratings that we consider.

Table 4. Financial Indicators of Bank Performance

Eq	Equity
As	Assets (excluding loans and debts to own branches)
Eq/As	Equity to assets ratio (indicator, inverse of financial leverage)
CA	Capital adequacy ratio* (standard N1)
SL	Short-term liquidity ratio* (standard N2)
CL	Current liquidity ratio* (standard N3)
GL	General liquidity ratio* (standard N5)
LNI/TA	Loans to non-financial institutions to total assets ratio
LLNI/TA	Long-term loans to non-financial institutions to total assets ratio
OL/LNI	Overdue loans to loans to non-financial institutions ratio
EA/As	Earning assets to assets ratio
LNR/Eq	Liabilities to non-residents to equity ratio
NGS/TA	Non-government securities to total assets ratio
GB/TA	Government bonds to total assets ratio
DPC/TA	Private customers’ deposits and accounts to total assets ratio
SFD/Eq	Surplus on forward deals to sell and buy currency to equity ratio
PBT/Eq	Profitability ratio (profit before tax to equity ratio)

* According to the Central Bank of the Russian Federation Instruction No 1 and additions

A second indicator that is generally considered to be important for creditability is capital adequacy (for the scale and nature of the bank's operations), a measure constructed by the Russian Central Bank as the ratio of equity and some risk weighted value of assets.⁹ The indicator is similar to the equity to assets ratio. In the models we will include one to the two, depending on which one is more significant. Sufficient capital forms a buffer that allows a bank to remain solvent and to continue to operate regardless of any unexpected events. A bank with a low capital adequacy (or insufficient equity) is exposed to a high risk of bankruptcy during a recession. On the other hand, a bank with too much equity usually lacks flexibility and competitiveness. Banks traditionally try to maintain the value of capital sufficiency at a low level in order to raise their efficiency and to increase the profit of investors, while supervising institutions prefer a higher value, since this improves the stability of the bank system. The Russian Central Bank imposes that the value of capital adequacy should be at least 10% for large banks and 11% for the others. Once this condition is satisfied, the effect of this indicator on bank flexibility, competitiveness, performance, and thus also on creditability, can be expected to be negative.

Liquidity, the ability of a bank to pay for its liabilities in time, is the third important characteristic for bank reliability. Indicators of short-term, current, and general liquidity will be used. All of them are expected to positively affect bank reliability.

The next group of indicators describes the bank's relations with enterprises in the non-financial sector. As argued above, such indicators are probably relevant for the specific Russian situation. They are not included by Molinero et al. (1996), for example. Working with enterprises is probably the most legitimate way for banks to increase their assets and to invest their funds. With restricted potential of stock and inter-bank markets, banks have to make investments in the real economy. Two indicators are used: all loans to non-financial institutions to total assets ratio (LNI/TA), and long-term loans (i.e., loans for more than one year) to non-financial institutions to total assets ratio (LLNI/TA). Investments in the real sector may suffer from risk of default, but a bank that does not give credit to the real sector is deprived of one of the main sources of profit. Investing in the real sector is probably the only way to make profit in the long run and as such can be seen as a signal of reliability.

The (overdue loans) to (loans to non-financial institutions) ratio (OL/LNI) reflects the quality of drawn credits and the effectiveness of the bank's credit risk department. The lower the overdue loans to loans to non-financial institutions ratio the more reliable and stable the bank will be.

The earning assets to assets ratio (EA/As) shows which part of accumulated assets is allocated to profit making activities. Banks with a high value of this ratio can be expected to make more profits and have higher reliability.

⁹ The weights are predetermined by the Instruction No. 1 by the Central Bank of the Russian Federation and reflect the default risk on the asset. For example, deposits in the Central Bank or government bonds of industrial countries get weight 0.0, weights for regional bonds are 0.2, weights for deposits in Russian commercial banks or banks of non-industrial countries are 0.7, etc.

The amount of non-residents' assets on bank accounts reveals how much confidence foreign investors have in the bank. This is measured by the (liabilities to non-residents) to equity ratio (LNR/Eq), which is expected to have a positive effect on the bank reliability ratings.

Investing in stocks and shares of other companies is not one of the main aims of a bank. Moreover, investments in non-government securities are, on average, more risky than other investments. The ratio NGS/TA reflects the share of non-government securities in total assets. We expect that it negatively affects reliability. Government bonds are a reasonably safe investment but do not have a very high return. It is therefore not so clear whether the government bonds to total assets ratio (GB/TA) will be positively or negatively related to bank reliability. A hump shaped pattern where a limited share invested in government bonds would be optimal is also possible.

The deposits and accounts of private customers to total assets ratio (DPC/TA) characterizes the ability of a bank to attract money from private investors, reflecting how much confidence people have in the bank. We expect a positive relation with the reliability ratings.

Many banks that allocated a too large share of their funds to operations on the money market crashed after the financial crisis of August 1998. Foreign banks wanting to buy Russian government bonds could not do this directly. They therefore lent dollars to Russian banks, which converted the dollars into rubles and invested these in government bonds, with a forward contract to repay dollars to the foreign banks. When the crisis started, the ruble lost its value and Russian banks were unable to meet their obligations on the forward contracts. This implies that the ratio of the surplus of forward deals to shareholders' equity (SFD/Eq) is expected to have a negative effect on bank reliability.

The profitability ratio (PBT/Eq) plays an important role in evaluating the reliability of a bank. Profit is a necessary condition for creating adequate funds to stimulate personnel and management, for expansion and innovation and for improvement of the quality of bank services. The importance of bank profit is high for all economic agents and depends on interest rates in bank operations, operating costs, and the structure of assets and liabilities.

Data on these indicators are publicly available in the commercial banks' balance sheets that banks send to the Central Bank of the Russian Federation every month. For the sample of 826 banks that are rated by at least one of the four rating agencies that we consider, a table of correlation coefficients and descriptive statistics of the variables used in the regressions is presented in Appendix 2. Most of the correlations are small. The only correlations larger than 0.5 are those between two measures of liquidity (SL and CL; correlation 0.699, between the equity to assets ratio and the strongly related index for capital adequacy (Eq/As and CA, correlation 0.845), between Loans to non-financial institutions to total assets ratio and equity to assets ratio (LNI/TA and EA/As, correlation 0.555) and between total assets and the overdue loans to loans to nonfinancial institutions ratio (TA and OL/LNI; correlation 0.847).

5 Survey among experts

For the purpose of our study, a survey among experts working in different banks and other financial institutions (but not rating agencies) was conducted. Twenty-five experts responded to the survey. Experts were asked to answer four sets of questions. First, they were asked to rate twenty well-known Russian banks on a five-point scale. Second, the experts were asked to indicate the five characteristics of bank activity that, in their opinion, were most important for a bank's reliability. They were offered a list of twenty indicators but could also add other characteristics.¹⁰ The ten characteristics presented in Table 5 were indicated as the most important.

Table 5. Indicators of bank activity that experts consider important for bank reliability

Indicator		% of experts listing the indicator among the five most important
Overdue loans to loans to non-financial institutions ratio	OL/LNI	72%
Current liquidity	CL	48%
Capital adequacy ratio	CA	48%
Equity	Eq	44%
Long-term liabilities to total assets ratio	LLi/TA	44%
Non-earning assets to total assets ratio	NEA/TA	44%
Assets	As	40%
Return on equity	PAT/Eq	40%
Short-term liquidity ratio	SL	28%
Long-term loans to non-financial institutions to total assets ratio	LLNI/TA	20%

The indicator that is listed most often is the overdue loans to loans to non-financial institutions ratio (listed by 72% of experts). Other characteristics that are often listed as important are liquidity standards, the standard of capital sufficiency, profitability of shareholders' equity, and the size of shareholders' equity. The long-term loans to non-financial institutions to total assets ratio LLNI/TA, our indicator for investment in the real sector of the economy, is considered among the five most important indicators by 20% of the experts.

In the third part experts were asked to rate sixteen virtual banks on the basis of data on the indicators in Table 4 that were a priori thought to be most important: Eq, Eq/As, LNI/TA, OL/LNI, PBT/Eq, and CL.

Finally, experts were asked to rank rating agencies and journals that publish ratings of Russian banks. In Table 6 the average rankings are presented. The table shows that experts have largest confidence in the western rating agencies. The four ratings that we will study in the empirical models are printed in italics. It is clear that the experts on average have more confidence in the "Expert" rating than in the other three.

¹⁰ Some experts in fact added some characteristics, but none of them gained more than 8%.

Table 6. Average expert rankings of rating agencies

Standard&Poor's	3.3
Moody's	3.4
Fitch IBCA	4.7
<i>Expert</i>	6.4
Interfax	6.4
<i>IC "Rating"</i>	7.4
RusRating	7.8
EA-Ratings	7.9
<i>IA "Mobile"</i>	8.3
<i>Profile</i>	8.8
Commersant	9.1
Company	10.4
Rate Bank	10.8

6 Empirical models for published ratings and expert opinions

In this section, the four major ratings will be explained from a small set of bank characteristics. The information that is available on the methodology underlying the construction of some of the ratings (see Section 3) will not be used, since we aim at comparability and use the same model specification strategy for the four ratings.

Since a rating is a qualitative ordinal variable, the natural choice for the analysis of ratings is a model of ordered response (*ordered probit*). See, for example, Greene (1997) for a detailed description of this model and Kaplan and Urwitz (1979) for the first application to bond ratings. The model is specified as follows. Let there be k ordered alternatives – denote them $1, 2, \dots, k$. Then the probabilities that bank t with a set of characteristics \mathbf{x}_t' will be classified in each of the classes $1, 2, \dots, k$ are given by:

$$\begin{cases} P(y_t = 1) = F(c_1 - \mathbf{x}_t' \boldsymbol{\beta}), \\ P(y_t = 2) = F(c_2 - \mathbf{x}_t' \boldsymbol{\beta}) - F(c_1 - \mathbf{x}_t' \boldsymbol{\beta}), \\ \dots\dots\dots \\ P(y_t = k - 1) = F(c_{k-1} - \mathbf{x}_t' \boldsymbol{\beta}) - F(c_{k-2} - \mathbf{x}_t' \boldsymbol{\beta}), \\ P(y_t = k) = 1 - F(c_{k-1} - \mathbf{x}_t' \boldsymbol{\beta}). \end{cases} \quad (1)$$

The function F is the distribution function of a standard normal random variable (*ordered probit*) or a random variable with a logistic distribution (*ordered logit*). The parameters of the model, which are estimated on the basis of the data in the sample, are the vector of slope coefficients $\boldsymbol{\beta}$ and the vector of threshold values \mathbf{c} . We tried both models, the difference between their performances was marginal, and we chose the ordered probit model (like Kaplan and Urwitz (1979)), because it gave a slightly higher value of log-likelihood.

6.1 Analysis of existing ratings

For each of the four ratings “Expert”, IC “Rating”, IA “Mobile”, and “Profile”, an optimal model was selected using Akaike’s information criterion, although we always kept in at least one of the indicators LNI/TA or LLNI/TA, since we are interested particularly in the role of credits to the real sector for reliability ratings.¹¹ The results are presented in Table 7. The predictive ability of the models is described in the bottom panel of the table. The Pseudo-R2 values show that the rating of IC “Rating” is easier to predict than the other ratings, suggesting that IC “Rating” uses more public information than the other rating agencies. The rank correlations between predicted and actual ratings are reasonably high for all four agencies. Particularly for IA “Mobile”, the model does a good job in predicting the ordering, although the Pseudo R2 value implies that the model cannot perfectly predict the level of each rating.

The categorical outcomes are coded from highest (1) to lowest (6 or 7) reliability, so that a positive coefficient implies that a higher value of the indicator reduces the reliability rating. All models contain the size indicator Eq (shareholder’s equity), which is always significant with the expected negative sign. Larger banks are rated as more reliable, keeping other characteristics constant.

Table 7. Models for existing ratings

Parameter	Rating			
	“Expert”	IC “Rating”	IA “Mobile”	“Profile”
LLNI/TA	-4.74***	1.703	-5.53***	3.94***
CA	0.0393***	0.0529***	0.0214***	
EA/As	3.33***			3.52***
Eq (billion rubles)	-0.51***	-0.89***	-0.82***	-0.042**
CL	-0.0234***	0.0153**	-0.0116*	
PBT/Eq			-2.43***	
SL		-0.0225***	-0.0041***	-0.0255***
GL		-0.0355**		
DPC/TA		-4.88**		
GB/TA				7.80***
Eq/As				-7.55***
<i>AIC</i>	2.59	1.19	2.26	2.66
<i>Pseudo-R2</i>	0.331	0.509	0.351	0.338
<i>Rank corr. actual and predicted rating</i>	0.75	0.76	0.82	0.78

*, ** and *** significant at 10, 5, and 1 percent level.

Capital adequacy is positive and significant for all ratings except “Profile”. As explained in Section 4, this may mean that, once the minimum equity requirement is met, a high level of equity indicates low flexibility and competitiveness, reducing opportunities for making profit and for growth, and thus reducing

¹¹ We also included some squares of the indicators but these were never significant.

reliability.¹² In the model for “Profile”, capital adequacy is represented by the indicator Eq/As, the share of equity in assets. This variable is significant but with the opposite sign, suggesting that “Profile” attaches more value to risk aversion than to competitiveness.

All four models contain at least one liquidity measure that is significant and has the expected negative sign. Current liquidity is negative and significant for “Expert” and IA “Mobile”, short-term liquidity for IC “Rating”, “Profile” and IA “Mobile”, general liquidity for IC “Rating”. For IC “Rating”, current liquidity has a positive sign, perhaps due to the fact that we also have included the other two liquidity measures.

Profitability can be captured by either the profitability ratio PBT/Eq, or the ratio of earning assets to total assets EA/As. For IA “Mobile”, the profitability ratio is significant and a higher profitability increases reliability, as expected. For “Expert” and “Profile”, however, EA/As is significantly positive, which would suggest that this profitability indicator would reduce these two reliability ratings. For IC “Rating”, neither of the two profitability indicators is included.

Investing in the real sector of the economy rather than in other financial institutions is evaluated positively by the ratings “Expert” and IA “Mobile”. For “Profile”, however, a large value of the indicator LLNI/TA reduces reliability. This is in line with the fact that “Profile” assigns high reliability to “sleeping” banks that do not invest in economic activity but choose very safe but probably non-profitable investments. For IC “Rating”, the indicator for investing in the real economy is not significant.

The ratio of deposits to private costumers arises only in the model for IC “Rating”, where it is significant with the expected positive sign. IC “Rating” assigns higher reliability to banks that manage to gain the confidence of private costumers. Finally, the ratio of government bonds plays a role only in the rating of “Profile”, where it has a negative effect on reliability.

Unexpectedly, none of the models includes the ratio of overdue loans to loans to non-financial institutions, which was the only indicator considered important by the majority of the experts (cf. Table 5). An interpretation of this result is that rating agencies do not trust the data on overdue loans provided by the banks. Standards of Russian accounting allow banks to reregister and prolong credits easily, thus decreasing the reported value of the indicator OL/LNI.

The indicator LLi/TA (long-term liabilities to total assets ratio) was also one of the indicators that many experts in the survey considered important (44%; cf. Table 5). It appears in none of the four models, however.

The indicator LNR/Eq (liabilities to non-residents to equity ratio) does not play any role either. This is probably because of the negligible volume of such assets after the 1998 crisis. Similarly, the indicator SFD/Eq (Surplus on forward deals to sell and buy currency to equity ratio) plays no role, since the volume of such operations at the moment of this research was negligible or perhaps since this indicator does not fully reflect the volume of operations.

All results taken together, it seems justified to conclude that the “Profile” rating deviates substantially from the other three. The common opinion that this rating overvalues “sleeping” banks that do not invest in

¹² We experimented with non-linearities to account for the positive effect of meeting the threshold but find no signifi-

economic activity is confirmed by the results. According to the model of the “Profile” rating, the four indicators relating to bank activity, the long-term loans to non-financial institutions to total assets ratio (LLNI/TA), the government bonds to total assets ratio (GB/TA), the Earning assets to assets ratio (EA/As), and equity to assets ratio (Eq/As) all reduce reliability. A bank that does not borrow money on the market and does not invest its assets in either credits or government bonds or in any earning assets at all is considered the most reliable. Such a policy may be optimal during a crisis but in the long run, a bank with this policy is unlikely to be competitive.

Table 8. Comparison of models

Model		Rating			
		IC Rating	Expert	IA “Mobile”	Profile
IC Rating	CA	0.0529***	0.0313***	0.0240***	-0.0585***
	LLNI/TA	1.703	-2.99*	-4.37***	2.33*
	Eq (billion rub)	-0.893***	-0.502***	-0.750***	-0.00885
	CL	0.0153**	-0.0280***	-0.00734	-0.00098
	GL	-0.0355**	-0.0122	0.00753	-0.00886
	SL	-0.0225***	0.00306	-0.00461***	-0.00872***
	DPC/TA	-4.88**	-5.20	1.00	-3.25
	<i>AIC</i>	1.19	2.74	2.34	2.94
	<i>Pseudo-R2</i>	0.509	0.304	0.331	0.265
Expert		IC Rating	Expert	IA “Mobile”	Profile
	LLNI/TA	2.755*	-4.743***	-6.17***	1.74
	CA	0.0298***	0.0393***	0.0246***	-0.0536***
	EA/As	1.233	3.326***	0.903*	2.75***
	Eq (billion rub)	-0.827***	-0.507***	-0.761***	-0.0209
	CL	0.00652	-0.02337***	-0.00969*	-0.00165
	<i>AIC</i>	1.34	2.59	2.37	3.03
	<i>Pseudo-R2</i>	0.415	0.331	0.313	0.230
	IA “Mobile”		IC Rating	Expert	IA “Mobile”
PBT/Eq		-0.0924**	-2.968	-2.426***	-0.861
CA		0.0512***	0.0264**	0.0214***	-0.0577***
LLNI/TA		3.103**	-2.78*	-5.53***	2.32*
SL		-0.0205***	0.00384	-0.0042***	-0.00892***
Eq (billion rub)		-0.786***	-0.483***	-0.822***	-0.00817
CL		0.00804	-0.0288***	-0.0116*	-0.000945
<i>AIC</i>		1.25	2.71	2.26	2.94
<i>Pseudo-R2</i>		0.470	0.304	0.351	0.260
Profile		IC Rating	Expert	IA “Mobile”	Profile
	LLNI/TA	1.30	-4.768***	-6.294***	3.936***
	GB/TA	0.147	0.480	-2.176	7.804***
	SL	-0.00742	-0.005390	-0.00341***	-0.02552***
	EA/As	0.320	3.443***	0.592	3.52***
	Eq (billion rub)	-0.798***	-0.450***	-0.790***	-0.0423***
	Eq/As	6.08***	4.142***	3.047***	-7.552***
	<i>AIC</i>	1.29	2.73	2.31	2.66
	<i>Pseudo-R2</i>	0.453	0.299	0.335	0.338

cant nonlinear effects.

The model for the rating of IA “Mobile” agency includes as significant 6 out of 10 indicators marked by experts (see Table 5) as the most important. This number is larger than that in the models for the other 3 ratings. In this sense the rating of IA “Mobile” is the rating that corresponds most to the expert opinions.

In order to get some insight in the sensitivity of the results for the model selection procedure and in the similarity between different ratings, the four model specifications in Table 7 were estimated for all four ratings. The results are presented in Table 8. The table suggests that IC “Rating”, “Expert” and IA “Mobile” are comparable. For each specification, signs and significance levels for these three ratings are largely in line with each other. As was already noted above, the rating for “Profile” journal differs substantially from the other three.

Table 9 presents an overview of the deviations between predicted and actual ratings, using the models in Table 7. The numbers in the upper line correspond to the difference between the predicted rating and the actual rating. For instance, “-2” means that the model predicts a rating that is two gradations more reliable than the actual rating. In the last column the share of forecasts with deviation not more than one gradation is given.

Table 9. Deviations between predicted and actual ratings

Δ	-3	-2	-1	0	1	2	3	$ \Delta \leq 1$
IC “Rating”	0%	0%	7%	80%	13%	0%	0%	100%
“Expert”	0%	5%	22%	49%	20%	3%	0%	92%
IA “Mobile”	0%	1%	15%	57%	26%	1%	0%	98%
“Profile”	3%	2%	20%	51%	19%	4%	0%	90%

The table shows that the model IC “Rating” predicts 80% of the ratings correctly. IC “Rating” and IA “Mobile” give the smallest number of prediction errors. The cases for which the difference between predicted and actual rating exceeds two gradations can be explained in more detail. For the “Expert” rating this difference equals +2 for BIN Bank and Gazenergoprombank. Both of these had substantial support at the moment of evaluation, the former from the oil company “Slavneft”, the latter from Gazprombank and Mostransgas – the companies connected with the gas industry. This fact was probably taken into account by the experts. The difference is -2 for Credittrust Bank, Mezhtopenergo Bank, Mostroyeconombank and, which had some difficulties (quality of given credits, etc.) at the moment of evaluation that can be taken into account in the actual ratings. A difference of three gradations occurs only for “Profile”, for banks Olimpiysky, National Reserve Bank, and Rosbank. All these three banks have a strong financial position but their actual rating by the “Profile” experts does not do justice to this.

6.2 Analysis of the expert evaluations of real banks

As explained in section 5, the survey asked 25 experts to rate 19 existing banks into 5 reliability groups. Some experts did not rate all banks, which led to 416 observations rather than 475. These observations were pooled and used to estimate ordered probit models, using the bank indicators described in section 4. A similar model selection procedure as in the previous section gave the results in Table 10.

Table 10. Model for expert evaluations of real banks

Included observations: 416	
Variable	Coefficient
PBT/Eq	-4.828***
LLNI/TA	-3.612***
Eq (billion rubles)	-0.0599***
Eq/As	2.99***
<i>AIC</i>	2.92
<i>Pseudo-R2</i>	0.078

The relatively low level of the pseudo R2 in comparison to the published ratings (Table 7) could be due to the fact that expert opinions vary substantially. After including expert specific dummy variables (i.e., fixed effects) the value of the generalized R2 rose to 0.124, which is still much lower than the values in Table 7. Thus it seems that the experts in the survey attach more value than rating agencies to bank characteristics that are not included in the publicly available balance sheets and put more weight on their specific knowledge about each bank.

The indicators included in the model in Table 10 are significant and have the expected sign. Profitability, bank size (i.e., equity), and focus on the real sector (LLNI/TA) all improve bank reliability in the view of the experts. The ratio of equity over assets is similar to the role that the capital adequacy indicator plays for the ratings IA “Mobile”, IC “Rating” and “Expert”. A high share of equity indicates a lack of flexibility and competitiveness.

As was noted earlier, many experts consider the ratio of overdue loans to loans to non-financial institutions as important for bank reliability (cf. Table 5). Still, this indicator is not included in the selected model and is insignificant if added. This is the same as for the published ratings. It may imply that the experts do not take the reported ratio seriously since it can be manipulated by reregistering overdue loans as new loans.

The main difference with the models for published ratings is that the three liquidity measures are not included, although many financial experts report that particularly current liquidity is an important indicator for reliability.

6.3 Expert evaluations of virtual banks

In the third section of the questionnaire experts were asked to rate 16 virtual banks, using information on six indicators only: the size indicator Eq, the capital adequacy proxy Eq/As, the indicator LNI/TA for activity in the real sector, the overdue loans measure OL/LNI, the indicator PBT/Eq for profitability, and the liquidity measure CL. The model presented in Table 11 was constructed using 382 obtained observations; in 18 of the 400 cases, the expert did not evaluate the bank. The optimal model was selected on the basis of the Akaike information criterion, as before. The result is presented in Table 11.

Table 11. Model for expert evaluations of virtual banks

Included observations: 382	
Variable	Coefficient
PBT/Eq	-1.99**
LNI/TA	-13.51***
(LNI/TA) ²	29.45***
OL/LNI	10.21***
Eq (billion rubles)	-0.0804***
<i>AIC</i>	2.76
<i>Pseudo-R2</i>	0.132

The Pseudo R2 of this model is larger than that for the expert evaluations of the real banks. For the real banks, the experts will also incorporate in their ratings the knowledge they have that is not captured in the indicators. Thus this comparison confirms that the expert ratings of real banks are not distant ratings but expert ratings. Still, the Pseudo R2 in Table 11 is much smaller than that in the models for the published ratings, and there seems to be a lot of disagreement among the 25 experts in how to evaluate the virtual banks.

As in all models discussed before, the indicator for bank size has the expected negative sign, implying that larger banks are considered more reliable. Profitability is also seen as a favorable characteristic, as in the model for expert evaluations of real banks. Unlike in all earlier models, we now find a significant effect of the indicator OL/LNI (overdue loans to loans to non-financial institutions ratio), implying that a high share of overdue loans reduces bank reliability. This corresponds with the fact that many experts report that this indicator is an important characteristic for bank reliability (Table 5), but the same indicator was insignificant in the expert evaluations of real banks as well as in the published evaluations. Our explanation for that finding was that in practice, banks are able to manipulate this indicator by reregistering existing overdue loans as new loans (that are not yet overdue). A plausible interpretation is that in evaluating the virtual banks, the experts do not take the possibility of such a manipulation into account and take the values of the indicator more seriously.

Another interesting outcome is that we find a significant quadratic pattern of the rating as a function of loans to non-financial institutions to total assets ratio (LNI/TA). The estimates imply that there is an optimal value of this indicator. Such a result was not obtained in any of the previous models, although it seems very plausible that an optimal value for this indicator should exist. If investments in the real sector are too small, a bank is likely to lose its competitive strength since it is deprived of one of the most important sources of income. If a bank invests too much, the risk of non-payment becomes too high and the liquidity of assets decreases. The point estimate of the optimum, 23%, seems rather low but this estimate is not very accurate. In most models for existing ratings and expert evaluations of real banks it was found that reliability increases with investment in the real economy.

Table 12 presents the Spearman rank correlations between predicted ratings for all models in this section, based upon the complete sample of 826 banks.

Table 12. Spearman rank correlations between different model predictions

Model	“Expert”	IC “Rating”	“Profile”	IA “Mobile”	Real banks	Virtual banks
“Expert”	1	0.28*	−0.03	0.54*	0.31*	0.19*
IC “Rating”	0.28*	1	−0.17*	0.27*	0.37*	0.15*
“Profile”	−0.03	−0.17*	1	−0.17*	−0.49*	0.13*
IA “Mobile”	0.54*	0.27*	−0.17*	1	0.38*	0.01
Real banks	0.31*	0.37*	−0.49*	0.38*	1	0.11*
Virtual banks	0.19*	0.15*	0.13*	0.01	0.11*	1

* means that the correlation is significant at 1% level.

The rank correlations between predicted agency ratings are significantly positive except for those with the “Profile” rating. This is in line with the actual ratings, cf. Table 2. Still, the correlations are smaller than those in Table 2, suggesting that the rating agencies take account of non-published information in a similar way. These three agency ratings are also positively correlated with the predictions of experts as derived from their evaluations of the real banks. Again, “Profile” is the outlier here, with a substantial and significant negative correlation with the predicted expert rating. The model based upon the expert evaluations of virtual bank gives predictions that are positively correlated with all other predictions except those based on the “Profile” model, but the correlations are surprisingly small (although significant in all cases but one). In particular, the rank correlation with the expert model based upon real bank evaluations is only 0.11. This may partly be explained by the small number of indicators used for the virtual banks, but can also be due to the fact that the information about the real banks is interpreted in a different way than that for the virtual banks. The discussion above on the difference of the effect of overdue loans illustrates the latter point.

7 Conclusion

The main goal of this study was to identify and compare the financial indicators that rating agencies and Russian experts in the banking sector find important for determining bank reliability. On the basis of publicly available quantitative information ordered probit models for four existing ratings of Russian banks (IA “Mobile” and IC “Rating” agencies, “Expert” and “Profile” journals) were constructed. Moreover, a survey among experts working in banks and other financial companies was drawn, giving ratings of well-known real banks as well as virtual banks described by just a few indicators. These data were used to estimate two models for expert opinions, based upon the evaluations of the real and the virtual banks.

It appears that three out of the four considered ratings (IA “Mobile”, “Expert”, and IC “Rating”) evaluate bank reliability in a similar way, and are also strongly correlated to the evaluations given by the experts. The fourth rating that we analyzed, “Profile”, differs fundamentally from these. This corresponds to the answers to the final question in the experts survey, where experts are asked to judge the existing ratings. “Profile” does worse than the other three, although the difference with one of these is not very large (cf. Table 6).

Financial characteristics of a bank such as its size (expressed in the indicator of shareholders' equity), liquidity indicators and the indicator of sufficiency of capital play a role in the models for all existing ratings and in the expert ratings. This is in line with the international literature on bank ratings and corporate bond ratings in general. The long-term loans to non-financial institutions to total assets ratio plays a role in most models; profitability of capital in only a few models. The model based upon expert evaluations of virtual banks seems to be most in line with prior expectations. This model gives predictions that are only weakly correlated with the predictions of other models (except "Profile"). Apparently, expert knowledge not captured in the public information plays a large role, for both rating agencies and the financial experts in the survey.

For an indicator such as the overdue loans to loans to non-financial institutions ratio, the fact that neither rating agencies nor experts evaluating real banks take this into account suggests that experts realize that for real banks this indicator is often manipulated by the banks and does not reflect the expectation of default risk that it stands for. In general, however, they do think that a non-manipulated values of this criterion is an important indicator. This is confirmed by the fact that most experts name this indicator as one of the most important characteristics for bank reliability and the fact that it is significant in the evaluations of virtual banks.

From this analysis, some lessons can be learned for the discussion on designing an Early Warning System (EWS). Such an EWS will allow fast screening of banks, trying to distinguish banks with a high risk of failure in the future from those with a low risk of failure. Models of bank ratings can be used as (ingredients of) an EWS. The idea that regulatory capital requirements should be risk-sensitive is at the core of the proposed changes to the Basel Capital Accord. The first pillar of the New Basel Capital Agreement assumes that each bank should use some Bank's Internal Rating System (IRB) (Basel Committee on Banking Supervision (2000,2001)). Such an IRB system could also be based on a statistical model of bank credit ratings and models of probability of default. Currently, only the US and French supervisory authorities make use of statistical models.

The results in this paper suggest that care should be taken in the choice of statistical model or benchmark rating underlying the EWS, at least in countries where well-established international rating agencies are not yet active on a large scale. Although they certainly have common elements, different rating agencies use different criteria or weigh the criteria in a different way. Moreover, banking experts from within the banking industry seem to use their own evaluation criteria, which are again correlated with but far from identical to the criteria used by the agencies. A particular concern applies to the mechanical use of seemingly objective numerical criteria if these numbers can easily be manipulated by the banks. Using expert opinions that explicitly account for such phenomena in addition to evaluations by well-established rating agencies and objective criteria incorporated in a statistical model seems a useful strategy to obtain a reliable early warning system.

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Appendix 1. Financial characteristics of bank activity**

<i>Acronym</i>	<i>Name</i>	<i>Detailed description</i>
1. Size		
As	Assets	Owned and drawn funds placed into lending and other activities
Eq	(Shareholders') Equity	The bank's equity is defined as basic and additional capitals. It includes share capital, bank's funds, accumulated profit as well as reserves for revaluation of currency, securities and precious metals, allowance for possible loss on non-risk loans and some negative adjustments*
TA	Total assets*	Assets enlarged by inter-branch and intra-bank transactions**
2. Activity on financial markets (accounts balances)		
GB	Government bonds	Bonds issued by the Ministry of finance and/or the Central Bank of the Russian Federation
LNI	Loans to non-financial institutions	Loans to non-banking entities (to non-financial institutions)
LLNI	Long-term loans to non-financial institutions	Loans to non-banking entities (to non-financial institutions) with a maturity of one year and over
EA	Earning assets	Interest bearing assets
LNR	Liabilities to non-residents	Credit accounts of Russian non-residents
NGS	Non-government securities	Securities issued by non-government entities
DPC	Private customers' deposits and accounts	Credit accounts opened with a bank by private customers
SFD	Surplus on forward deals to sell and buy currency	Surplus on forward deals to sell and buy currency
3. Liquidity and capital adequacy		
CA	Capital adequacy ratio* (standard N1)	Ratio of equity to assets weighted on risk, values of credit risks on instruments and term deals, reflected on off-balance accounts, and value of market risk less loss reserves on medium-risk loans and securities
SL	Short-term liquidity ratio* (standard N2)	Ratio of the sum of highly liquid bank assets (cash money, call accounts, precious metals, some reserves) to the sum of bank's call liabilities
CL	Current liquidity ratio* (standard N3)	Ratio of the sum of bank's liquid assets to the sum of bank's liabilities on call accounts and term accounts with a maturity of up to 30 days
GL	General liquidity ratio* (standard N5)	Ratio of liquid assets to assets
4. Income and loss characteristics		
PBT	Profit before tax	Income before profit tax deduction
PAT	Profit after tax	Income less profit tax
OL	Overdue loans	Debts not redeemed at maturity (defaulting debt at least for one day)

* According to the Central Bank of the Russian Federation Instruction No 1 and additions

** According to Russian accounting standards.

Appendix 2. Statistics of financial indicators of banks

Correlation coefficients of bank characteristics (for the sample of 826 banks)

	PBT/Eq	LLNI/TA	CA	GB/TA	LNI/TA	SL	OL/LNI	EA/As	Eq	Eq/As	LLi/TA	CL	TA
PBT/Eq	1	0.011	0.029	0.028	0.042	-0.046	-0.001	-0.029	0.009	0.025	0.014	-0.072	0.007
LLNI/TA	0.011	1	0.085	-0.063	0.459	0.024	-0.055	0.372	0.016	0.207	0.236	0.047	-0.031
CA	0.029	0.085	1	0.006	-0.131	0.292	0.009	-0.116	-0.016	0.845	-0.143	0.317	-0.072
GB/TA	0.028	-0.063	0.006	1	-0.222	0.109	0.059	0.172	0.094	-0.083	0.147	-0.017	0.003
LNI/TA	0.042	0.459	-0.131	-0.222	1	-0.104	-0.129	0.555	-0.041	0.055	0.142	-0.040	-0.084
SL	-0.046	0.024	0.292	0.109	-0.104	1	0.012	-0.084	0.018	0.179	0.148	0.699	-0.022
OL/LNI	-0.001	-0.055	0.009	0.059	-0.129	0.012	1	-0.102	0.065	-0.031	0.066	0.011	0.847
EA/As	-0.029	0.372	-0.116	0.172	0.555	-0.084	-0.102	1	0.083	0.142	0.320	-0.048	-0.083
Eq	0.009	0.016	-0.016	0.094	-0.041	0.018	0.065	0.083	1	-0.032	0.027	-0.015	0.298
Eq/As	0.025	0.207	0.845	-0.083	0.055	0.179	-0.031	0.142	-0.032	1	-0.063	0.328	-0.072
LLi/TA	0.014	0.236	-0.143	0.147	0.142	0.148	0.066	0.320	0.027	-0.063	1	0.175	0.054
CL	-0.072	0.047	0.317	-0.017	-0.040	0.699	0.011	-0.048	-0.015	0.328	0.175	1	-0.019
TA	0.007	-0.031	-0.072	0.003	-0.084	-0.022	0.847	-0.083	0.298	-0.072	0.054	-0.019	1

Descriptive statistics of bank characteristics (for the sample of 826 banks)

	PBT/Eq	LLNI/TA	CA	GB/TA	LNI/TA	SL	OL/LNI
Mean	0.041	0.0911	34.6	0.0343	0.364	64.9	0.0308
Median	0.058	0.0585	29.5	0.0048	0.366	52.7	0.0082
Maximum	0.861	0.7407	158.7	0.5215	0.820	1231.2	3.4196
Minimum	-35.63	0.0000	0.10	0.0000	0.0071	5.5	0.0000
Std. Dev.	1.263	0.1031	20.5	0.0673	0.168	67.2	0.1326

	EA/As	Eq (billion rubles)	Eq/As	LLi/TA	CL	TA (billion rubles)
Mean	0.572	0.4877	0.248	0.067	103.2	12.14
Median	0.589	0.0771	0.208	0.039	82.45	0.416
Maximum	2.480	60.28	0.941	0.682	1863	5897
Minimum	0.014	0.00132	0.0009	0.000	41.3	0.00434
Std. Dev.	0.186	3.000	0.150	0.087	91.26	215.9