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Financial System

ASSESSMENT OF RUSSIAN NON-FINANCIAL COMPANIES' SYSTEMIC RISK IN FINANCIAL STABILITY MONITORING

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Abstract

Subject. The article addresses the issues of financial stability monitoring as part of macroprudental supervision and regulation. The study concerns non-financial companies as a source of systemic risk for the national financial system. There are a lot of discussions about monitoring of systemically important borrowers under the auspices of the Russian Regulator.

Objectives. Research is aimed at developing a methodology for assessing the systemic risk of Russian non-financial companies.

Methods. We propose a set of indicators to assess the systemic risk derived from non-financial companies in Russia. The sample of indicators corresponds with the leading international practice and available data. The dynamic analysis of the sampled indicators should be conducted. We should focus on separate indicators and for a comprehensive view using a new composite indicator of systemic risk.

Results. We devised a methodology for assessing the systemic risk of Russian non-financial companies. The relevance of the methodology was proved with empirical data. The sample includes 3,766 companies per year. The proposed indicators were proved to reflect an adequate change in the tested period (the year before, during and after financial instability).

Conclusions and Relevance. Our methodology contributes to the current scientific discussion on new directions for assessing the financial stability. The results can be applied to the analytical practice, including the macroprudential supervision and regulation.

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Introduction

Currently, the Bank of Russia initiated discussions on the relevance of monitoring[1] the systemically important borrowers[2] (as well as of setting threshold values of debt burden for them) within the framework of macroprudential supervision and regulation. The Bank of Russia recognizes a high level of debt burden among the largest borrowers as a systemic risk of financial stability, which is associated with the possible spread of consequences of such companies' default to the entire financial sector[3]. At the same time, the Regulator focuses on the fact that the consequences of the systemic risk associated with the excessive debt burden of borrowers will be experienced, first of all, by the banking sector. As a result, monitoring of the systemic risk of non-financial companies is supposed to be carried out at the bank level at the stage of evaluating a potential borrower before issuing a loan[4].

Taking into account the power of the Bank of Russia as a subject of macroprudential policy in respect of regulatory objects and methods [2], as well as a leading role of the banking sector as a provider of external funding for the domestic business [3, p. 420], it can possibly be reasonable to delegate the systemic risk monitoring of non-financial companies to banks. However, in some cases, banks may knowingly take greater risks, neglecting serious consequences. At the same time, financial regulators are not always able to control the situation, since in theory banks cannot violate existing rules. The literature refers to such cases when banks accept unreasonably high risks. Let's consider some of them.

Thus, as reported by E. Gerba, the Danmarks Nationalbank's representative [4, pp. 98–102] at the Bank of Russia conference dedicated to macro-prudential policy, banks are assumed to tend to greater risks due to their limited liability for obligations arising from deposit insurance. It should be noted that now in Russia, not only individuals and individual entrepreneurs (since 2014), but also small enterprises (from January 1, 2019)[5] are included in the scope of deposit insurance. In addition, there are discussions concerning the inclusion of other legal entities' accounts into the insurance coverage[6]. Thus, the problem articulated by E. Gerba seems to be relevant for the near future of the Russian financial system.

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[1] On possible macroprudential measures to limit the debt burden of non-financial organizations. Bank of Russia Consultation Paper, 2019, pp. 2–3.
URL: https://www.cbr.ru/Content/Document/File/71241/Consultation_Paper_190410.pdf.

[2] The Russian megaregulator considers such companies large non-financial companies with a high level of debt burden.

[3] From theoretical perspectives, the Bank of Russia acts consistently with the hypothesis of H. Minsky stating that there is the relationship between successive changes in treatment of investment financing from enterprises and the financial stability threats. For more details see the example [1].

[4] On Possible Macroprudential Measures to Limit the Debt Burden of Non-Financial Organizations: Public Consultation Report by the Bank of Russia, 2019, pp. 12–13.
URL: https://www.cbr.ru/Content/Document/File/71241/Consultation_Paper_190410.pdf (In Russ.)

[5] On Improving the System of Mandatory Deposit Insurance in Banks of the Russian Federation: Public Consultations Report, 2019, p. 2.
URL: https://www.cbr.ru/Content/Document/File/72642/Consultation_Paper_190701.pdf (In Russ.)

[6] Ibid., p. 3–6.

Notably, the review of the Russian financial stability (hereinafter referred to as the FSR) for Q2 and Q3 2019 mentions an increase in the bank loan portfolio concentration on major borrowers[7]. The regulator explains this trend stems from differences in methods banks use to calculate the debt burden and the probability of default[8]. In the mean time, different banks assigned significantly different probabilities of default to the same largest borrowers. Obviously, the inefficient financial evaluation of borrowers leads to an increase in the systemic risk of non-financial companies, affecting the financial stability.

There is a noteworthy hypothesis stating that macroprudential regulation instruments, which are designated to increase the stability of the banking sector in the downturn phase of the credit cycle (in particular, capital buffers), can stimulate the risk-oriented behavior of banks. This is explained by the desire of banks to compensate for restrictions affecting their financial results. In a report by E. Dautović, a representative of the University of Lausanne, at the Bank of Russia conference [4, pp. 110–111], this hypothesis (*improper behavior*, or *moral hazard*) is tested empirically and partially confirmed (for the banks that meet certain characteristics). According to the results of this research, an increased risk appetite levels the effect of macroprudential regulation tools.

Another real-life example can be found in studies analyzing the "lost decade" in Japan. During the period following the collapse of the financial bubble, banks extended terms of loans granted to weak, potentially defaulted companies, realizing that these loans would not be repaid (so-called 'evergreen loans') [5]. The literature refers to two reasons explaining banking behavior in Japan. First, the reluctance to recognize losses in financial statements, thus getting exposed to tightened regulatory requirements obliging them to make greater reserves for possible loan losses. Second, the interdependence of creditor banks and borrowing companies[9].

Thus, an independent assessment of non-financial companies' systemic risk is necessary, which, in our opinion, should be carried out by the Regulator within the framework of macroprudential supervision and regulation, which determined the direction and purpose of this research. The article substantiates a methodology for assessing the systemic risk of the Russian non-financial companies, which contributes to the current scientific discussion on new directions for assessing financial stability[10].

[7] Financial Stability Review, Q2–Q3 2019: Information and Analytical Review. Bank of Russia, 2019, pp. 38–39. URL: https://www.cbr.ru/Collection/Collection/File/25493/OFS_19-02_e.pdf (In Russ.)

[8] Ibid.

[9] However, we should mention the possible involvement of the Japanese Government, which would oblige banks to support some companies so as to avoid a spike of unemployment and other costs due to the bankruptcy of non-competitive borrowers [5].

[10] Note that there is no special section devoted to the outcome of non-financial sector companies' monitoring in financial stability reviews published by the Bank of Russia. No. 1 of 2016 was the last issue where such a section was presented [6, p. 636]. Afterwards systemic risks associated with non-financial companies are considered only as part of the analysis of banks' corporate portfolio. URL: http://www.cbr.ru/publ/stability (In Russ.) However, developed countries usually publish such sections about their practices. Examples include financial stability reviews of the European Central Bank (URL: https://www.ecb.europa.eu/pub/financial-stability/fsr/html/index.en.html (In Russ.) and the US Federal Reserve (a FSR publication as a separate edition on the regulator's website in June 2019; Previously, the analysis of financial stability risk used to be provided in the annual reports. URL: https://www.federalreserve.gov/publications/financial-stability-report.htm (In Russ.)

The Methodology for Assessing the Systemic Risk of the Russian Non-Financial Companies

The proposed methodology comprises a system of indicators that are calculated through a representative sample of non-financial companies. It is supposed to use data covering all non-financial companies (not only the largest borrowers), since the method is designed to monitor financial stability at an aggregated level, rather than at the level of individual lending banks. In such a case it is sensible to consider whether there are a significant number of relationships between potential borrowers, which is important for assessing the systemic risk in particular.

Indicators for monitoring were selected by the experience of developed countries. First of all, the analytical practice of the European Central Bank (ECB) and the US Federal Reserve System (FRS) was taken into account. The formation of the indicators was guided in accordance with the Staff Guidance Note on Macroprudential Policy[11] of the International Monetary Fund. Characteristics of the Russian economy are an important factor for the selection of indicators and the formation of a methodology for their assessment. In this regard, at all stages of the study (the selection of indicators, assessment of their threshold values, testing of the indicators, interpretation of the values), we relied on the results of scientific research into the Russian economy.

The systemic risk was assessed with six indicators, taking into account various aspects of the companies' financial position, primarily, the level of financial stability and efficiency (*Table 1*).

The first indicator – financial leverage – is calculated by the ECB and the FRS. It reflects the long-term financial stability of enterprises in terms of the burden of long-term borrowed funds on equity capital. The indicator is also included in the list of indicators the IMF recommends to calculate[12].

The Russian studies proved the significance of the ratio of net payables to assets [7, pp. 54–55]. It reflects a level of financial stability in the near future.

The following two ratios – the interest coverage ratio and the debt service ratio – show how burdensome it is for a company to service a bank debt. It is assumed that both indicators are included in the analysis, because, despite a similar interpretation, they have different calculation logic. International [8, 9] and Russian [10, 11] studies confirmed that both indicators are effective and complement each other.

The net return on assets shows business effectiveness and the ability to generate profits, that is, a source of funds for the production development and expansion of activities. The net return on assets is chosen because the Russian studies use it with reference to the issue [7].

Similarly to developed countries, assessing the exposure of companies in the Russian real economy to default as an extreme manifestation of their financial instability is an aspect

[11] Staff Guidance Note on Macroprudential Policy. URL: https://www.imf.org/en/Publications/Policy-Papers/Issues/2016/12/31/Staff-Guidance-Note-on-Macroprudential-Policy-PP4925

[12] Ibid.

to be monitored. Excluding the industry specifics, the Altman's model (*Z"*-score) may work well for the purpose [12, pp. 40–41]. According to research conducted in 2014 and using a sample of companies from different countries, including Russia, this version of the Altman's model can be used at the present time [13]. It should be noted that *Z"*-score accommodates for various aspects of the financial position and corporate operations. This indicator cannot be exclusively used if we intend to make results more reliable. If the dynamics of all indicators is similar, this will not affect the results of the analysis.

As for the selected indicators, the dynamic analysis is recommendable. In the mean time, the dynamic analysis can proposedly apply to both individual indicators and a comprehensive view through the Composite Systemic Risk Indicator of Non-Financial Companies ($CSRI_{NFCs}$). It is indicative of the systemic risk associated with non-financial sector companies. Therefore, some steps shall be made as follows.

1. Make a representative sample of companies.
2. Compute median values per year[13].
3. Determine threshold values of the indicators. This shall be done to identify financial stability threats and possible measures to eliminate them. *Table 2* presents the threshold of the indicators and the rationale for their selection.
4. Normalize indicators in a linear way. This procedure is important for making indicators comparable and subsequently build a composite indicator. The procedure brings the variation bounds to the range of 0 to 1. The normalization makes 1 (the upper limit after normalization) correspond to the worst variation bound of the indicator, while 0 (the lower limit) matches the best one[14].
5. Determine the value of the composite systemic risk indicator of Russian non-financial companies. Its calculation is made according to the following formula:

$$CSRI_{NFCs} = 0{,}2 \cdot \left(FL + NPA + 0{,}5 \cdot \left(ICR + DSR \right) + NROA + Z'' \right),$$

where *FL*, *NPA*, *ICR*, *DSR*, *NROA*, *Z"* stand for normalized values included in the assessment system.

In the formula, all characteristics of the company's financial position have an equal weight. Hence, debt burden indicators (interest coverage ratio and debt service ratio) are calculated with an additional coefficient of 0.5.

The upward dynamics of the composite indicator is interpreted over time as an increase in the non-financial companies' systemic risk and vice versa. The composite indicator seems to be more convenient as compared to individual indicators. Thus, any difficulties in one of the analyzable areas do not necessarily mean the same trend in the systemic risk of the sector, since it can be offset by a favorable situation in other aspects. The proposed

[13] Trends in basic indicators are to be analyzed, following this step.

[14] Linear normalization formulas are given in [14, p. 15].

approach takes this into account, so its integration into the financial stability monitoring system seems to be justified.

In addition to the composite indicator, it is possible to analyze its components (normalized values) using heat maps. Doing so, we visually assess the distance to dangerous thresholds and their dynamics per component. It should be noted that the financial sustainability of non-financial companies is evaluated with the composite indicator and heat maps, following the logic consistent with that the Bank of Russia uses to assess the systemic risks of the financial sector [15, pp. 29–30].

The Technique Testing Methodology

We empirically verified the feasibility of the proposed systemic risk assessment methodology for the Russian non-financial companies. We preliminarily chose a period of time for the data underlying the verification. It spans the period of 2007–2010 and includes a) years of financial instability (the Russian financial and economic crisis[15] in 2008–2009), b) the year just preceding it (2007), c) the first year of the recovery (2010).

As scientific papers emphasize, the first negative phenomena in the real sector of the Russian Federation began to emerge in H1 2008 and had no relation to difficulties in the financial sector. Thus, as put by V.V. Ivanov [16, p. 6], the shrinking demand significantly reduced the volume of construction work. Consequently, this caused a decrease in output in some industries that are dependent on construction (mainly, in the industrial sector, i.e. the manufacturing of building materials and equipment [16, p. 6]). Later on (from July), the financial and economic crisis in Russia began to spread, being fueled by by negative phenomena worldwide.

The world financial and economic crisis has caused, first, a decline in the export-oriented industries (for example, metallurgy) [16, p. 7] due to a falling demand in foreign markets, and second, an increase in interest rates in the international credit market and limited access of the Russian companies to it [17, p. 17]. The decline in oil prices and the deterioration of the balance of payments were followed by a chain of coherent events that took place directly in Russia, which shocks in the oil and gas market propagated across the entire real sector. Thus, as the regulator held a gradual devaluation of the Russian ruble (to improve the balance of payments, which has worsened due to falling oil prices [16, p. 8]), many commercial banks refocused from corporate and retail lending to speculative operations [17, p. 10, p. 22]. Responding to this, the Bank of Russia increased the refinance rate by the end of the year, which cut amounts lend companies in the real economy and individuals [17, p. 18].

We chose period in which the financial position of many Russian companies obviously worsened simultaneously, because we need to verify the feasibility of the proposed

[15] Determining concepts of economic and financial crises, we referred to interpretations by V.V. Ivanov [16, p. 11]. Thus, the economic crisis shall be construed herein as a phase of the business cycle (recession), which mainly sees a slump in the market, imbalances in the national economy, a decrease in business activity, an increase in corporate bankruptcies. The financial crisis means a crisis that arises in a financial market, manifesting a shortage of financial resources, a fall in prices for financial assets and stock indices, a decrease in liquidity, weakened national currency and a drop in financial institutions' solvency.

indicators. In this case, assuming the challenges the Russian business experienced in 2007–2010, we should expect a certain dynamics of the indicators. With this in view, the following hypothesis was tested. Indicators in the assessment system (both separate and a part of the composite indicator) reflect (a) a deterioration of the companies' financial health and, accordingly, an increase in the corresponding systemic risk in 2008–2009; (b) an improvement of the companies' financial health and mitigation of the systemic risk in 2010. Thus, if the indicators reflect an adequate change, the hypothesis is expected to be true, and the proposed monitoring methodology can be recognized feasible.

To use a set of indicators correctly, their construction and evaluation shall rely on a high-quality sample. Therefore, the preparation for the calculations and the subsequent analysis of results constitutes an important preliminary step[16]. We refer to the data from non-consolidated financial statements (RAS) of the Russian legal entities (diverse profit-making organizations) except for financial activities, public administration and extraterritorial organizations (OKVED 2 sections (Russian National Classifier of Types of Economic Activity (OK 029 – 2014)) K, O, U, respectively). The data proceed from the SPARK system. Data frequency is one consecutive year. The data period includes additionally 2006. It is not included in the substantive analysis, but is necessary for calculating average values for 2007 (for example, net return on assets).

The data were prepared for the analysis in two steps, gleaning the initial sample. This is done to make the sample relatively homogeneous, with its units together reflecting a real view of current processes in the non-financial corporate sector. At the first step, we exclude small companies, companies with significantly sparse reporting data[17], companies with significant financial misstatements (for example, negative assets and revenue, inequality of assets and liabilities amounts, etc.).

Consequently, we got a sample of 3,766 legal entities per each year. At this stage, we verify whether the sample is representative. Doing so, we compare a series of total sampled data and aggregated microdata on companies operating in respective sectors published by the Russian Federal State Statistics Service (Rosstat), according to key figures of financial statements (assets, liabilities, revenue, cost of production). The data were found to strongly correlate, as the comparison showed. Meanwhile, as for comparable indicators, on average, during the observation period, the sample ranges from 31.84% (by cost) to 41.21% (by assets) of their total with respect to companies in the non-financial sector. As a result of the above procedures, the analyzable sampled population was recognized as representative for purposes of research.

At the second step of input data verification, we drop out companies whose financial indicators assets significantly differed from the main sampled population[18]. Threshold values of percentiles are chosen so as to on the one hand, get rid of outliers, which

[16] The methodology of selecting and processing data for sampling is based on the following works [7, p. 52; 18, pp. 42–44; 19, pp. 385–388; 20, pp. 11–14].

[17] Most sections of the balance sheet and statement of financial results of such companies are not filled in, while formally there are no financial misstatement.

[18] This means that they are not typical for most Russian non-financial companies in a given period of time.

considerably *pull out* distribution tails and, on the other hand, take into account the diversity and specific effects typical of companies from different sectors of the economy. Thus, the final sample includes from 94.66% (2007) to 95.72% (2009) units in each year from the set of companies, which was produced at the first step of data processing. As a result of the second step, the sample was not reduced considerably. Therefore, the representativeness check was not repeated.

The Technique Testing Results

Afterwards we computed median values of basic indicators per year. Based on the sample, the values demonstrate the expected dynamics (*Fig. 1* and *2*). Thus, in 2008, all median values more or less worsened. The financial position of non-financial companies took a dip, on average, in 2008. The financial stability dropped (financial leverage and the ratio of net payables to assets increased). It became more difficult for companies to serve the existing debts (ICR decreased and DSR increased), and the operating efficiency deteriorated (net return on assets decreased). The dynamics of the *Z"*-score reflects the situation in an aggregated way.

The following year, all indicators retained the change trends, with the exception of financial leverage. The latter showed a 17% decrease as year-on-year. The value changed so due to the fact the business accumulated accounts payable as credit facilities appreciated [17, p. 11]. In the mean time, repaying the existing loans, including long-term ones, companies did not take out new ones, which could decrease the efficiency of business, however, the financial stability risk also lowered.

However, financial leverage could go down for another reason. That is, there became more companies with the negative section *Capital and Reserves* in the balance sheet (approximating the equity when calculating the financial leverage). In this case, the lower tail of the distribution (with negative values) would *pull* the median value of the financial leverage towards smaller (negative) values. As long as undesirable fluctuations of the indicator occur on a fragmented interval (from $-\infty$ to 0, as well as extremely high values), its downward modification would be an unreasonable understatement for the same reason, thus distorting the conclusions on financing risk of the Russian enterprises (on average).

Therefore, we carried out an additional analysis. To verify this assumption, we determined the 1st and 3rd quartiles of the distribution across the financial leverage indicator in each year (*Table 3*). Values of the percentiles prove that it is not only a growth in the percentage of negative values the indicator arrived at that caused such a decrease in the median value of financial leverage, but more rather a reduction in the number of companies with the high financial leverage, which resulted in a lowering indicator of the third quartile in 2009 (by 0.11 c.u.). As the analysis shows, the negative value of the *Capital and Reserves* section is not typical of companies even during the analyzable crisis. Negative values have an insignificant effect on the outcome of research.

The way the indicators behaved in 2010 mirrors the recovery of the Russian economy [17, p. 18] with respect to the Russian non-financial companies, except for the financial leverage. Its dynamics met expectations in the previous period, as well as the ratio of net payables to assets, which continued growing. The dynamics of the latter can results from the persisting high cost of loans.

In general, the analysis of input indicators confirms their relevance. The revealed dynamics corresponds to the phases of the cycle that the economy has gone through (decline, recession, the beginning of recovery), and accurately reflects how the systemic risk of enterprises is expected to change.

Then, in order to determine whether indicators of companies' financial position can be used to build a composite indicator, their correlation was checked[19]. Correlation matrices were built for each year. As the analysis shows, for purposes of research, indicators can be applied jointly, since we did not discover significantly high values (from 0.7 and more[20]) of the linear correlation coefficients (*Table 4*).

In some cases, in the analyzable period indicators have quite high growth rates in the test sample. For example, this is true for the ratio of net payables to assets. However, their absolute values cannot be considered *dangerous* in terms of their influence on the financial stability. This point is important when assessing the level of risk. It should be taken into account at the following stage when the composite indicator is made by setting threshold values of indicators (the upper and lower bounds). Indicators are considered within the bounds of fluctuations. When they go outside the bounds, they turn into *definitely dangerous* or *not dangerous* in terms of risk assessment. The calculations were based the bounds used in accordance with the adopted methodology (*Table 2*). After the intervals were closed, the linear normalization of the indicators was carried out. To visualize the findings, heat maps were prepared, reflecting how far values of the indicators lay from their thresholds (*Fig. 3*).

At this stage of the analysis, we further clarified the nature of doubtful indicators (leading, synchronous, and lagging). For example, DSR[21] and Z"-score were presumed to be of anticipatory nature. This procedure is important because it determines whether normalized values of the indicators can be used in the future to build a composite indicator. Analyzing the heat map, we confirmed this possibility, since most of the indicators arrived at their worst values all at once in 2009, meaning that all of them can be considered synchronous.

Moving on with the analysis, we constructed the composite indicator of the systemic risk the Russian non-financial companies were exposed to (*Fig. 4*). Having analyzed the dynamics of the composite indicator, we found out that the systemic risk of non-financial companies demonstrated its highest growth for the period in 2008. The growth

[19] In terms of the linear correlation coefficient.

[20] The value is set expertly.

[21] The leading nature of DSR is showed, for example, in [9, pp. 28–30; 11, pp. 10–13]. Nevertheless, as long as our methodology does not provide for this indicator to be additionally processes, it was important to check whether it retained this property in its original form.

slowed down in 2009, assuming its upward trend in 2010. This is consistent with the current situation in the Russian economy. Thus, the hypothesis in question was verified, making the proposed technique applicable to the financial stability monitoring.

Conclusion

As a result, we produced our own technique to assess the systemic risk of the Russian non-financial companies. Indicators were selected in line with the leading international practice of financial stability monitoring (IMF, ECB, US FRS) and the availability of the data on the domestic companies. The resultant set of indicators is reinforced with the composite indicator of systemic risk. This indicator is relevant, since it gives a comprehensive view of the systemic risk, accommodating from all the aspects to be assessed.

As long as we compute correct values of the indicators included into the system both separately and in the integral form, we prove the feasibility of our methodology for the financial stability monitoring. Thus, the study seems to streamline the assessment of the systemic risk of corporate borrowers. The findings can be useful in analytical practice, including by the Bank of Russia as part of the macroprudential supervision and regulation. However, the methodology should undergo subsequent systematic tests to prove its practical significance.

Table 1
Indicators for assessing the systemic risk of the Russian non-financial companies

Indicator	Abbreviation	Calculation	Financial characteristics	The dynamics of a reduction in the systemic risk
Financial leverage	FL	The ratio of *Long-Term Liabilities* and *Capital and Reserves* in the balance sheet	Long-term financial sustainability	–
The ratio of net payables to assets	NPA	The difference between *Accounts Payable* and total *Accounts Receivable* and *VAT on Acquired Valuables* to total assets (the balance sheet sections)	Short-term financial sustainability	–
Interest coverage ratio	ICR	The ratio of profit before interest and taxes to interest payable	Debt burden	+
Debt service ratio	DSR	The ratio of short-term borrowings to the company's revenue for the corresponding year [18, pp. 44–45]	Debt burden	–
Net return on assets	NROA	The ratio of net profit to average assets for the corresponding year	The efficiency of the company's activities	+
Z"-Score	Z"	The calculation is based on the Altman's model [12, pp. 40–41]	The probability of default	+

Source: Authoring

Table 2
Thresholds (variation bounds of values) of indicators for constructing the composite indicator

Indicator	Thresholds		The rationale for the thresholds
	Lower bound, c.u.	Upper bound, c.u.	
FL	0	1	The values are set expertly. The zero bound was established on the assumption that it be so rare and not frequent when "*The value of the Capital and Reserves section is negative*" and it insignificantly influences the median value of the indicator. This hypothesis was verified by testing the methodology. The upper bound is established on the assumption that financial stability is possible provided long-term debts do not exceed the equity
NPA	–0,05	0,1	Values and preferable dynamics are based on the expert assessment as a result of the study by A.N. Mogilat, I.B. Ipatova
ICR	0	3	Thresholds selection is based on the work of S. Beshenov and I. Rozmainskii
DSR	0	0,166	The bounds are set, assuming that the research results of debt burden factors conducted under the aegis of the Bank of Russia
NROA	0	0,05	Values are set expertly in line with findings of S. Donets, A. Mogilat and A.N. Mogilat, I.B. Ipatova
Z"	1,1	2,6	Threshold are determined by E. Altman for the model used

Source: Authoring based on [20, p. 15], [10, pp. 137–138], [18, pp. 48–49], [20, p. 15], [12, p. 40]

Table 3
The distribution of financial leverage, 2007–2010

Indicator	2007	2008	2009	2010
1st quartile, c.u.	0,03	0,04	0,03	0,02
3rd quartile, c.u.	1,59	1,58	1,47	1,5

Source: SPARK; authoring

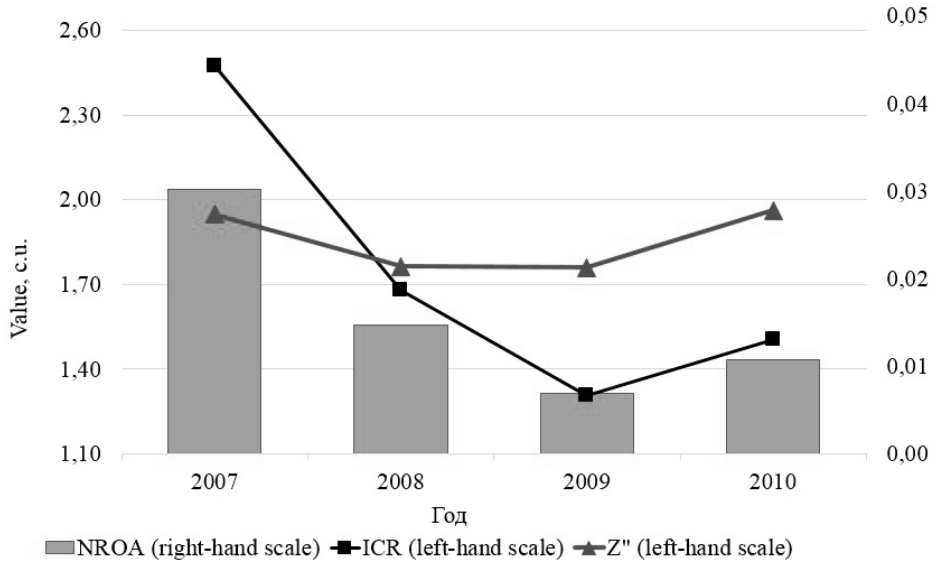
Table 4
The correlation matrix, 2007, c.u.

Variable	*ICR*	*FL*	*DSR*	*NPA*	*NROA*	*Z"*
ICR	1	–0,0371	–0,0851	0,0176	0,2902	0,2246
FL	–0,0371	1	0,1079	–0,0388	–0,0824	–0,054
DSR	–0,0851	0,1079	1	–0,1195	–0,2083	–0,2733
NPA	0,0176	–0,0388	–0,1195	1	–0,0751	–0,325
NROA	0,2902	–0,0824	–0,2083	–0,0751	1	0,6221
Z"	0,2246	–0,054	–0,2733	–0,325	0,6221	1

Note. Obviously, it is sufficient to calculate correlation coefficients for one year only to check the indicators for linear interdependence availability. Nevertheless, following the precautionary principle, matrices are also constructed for 2008–2010. However, this does not show the availability of indicator high correlation, either.

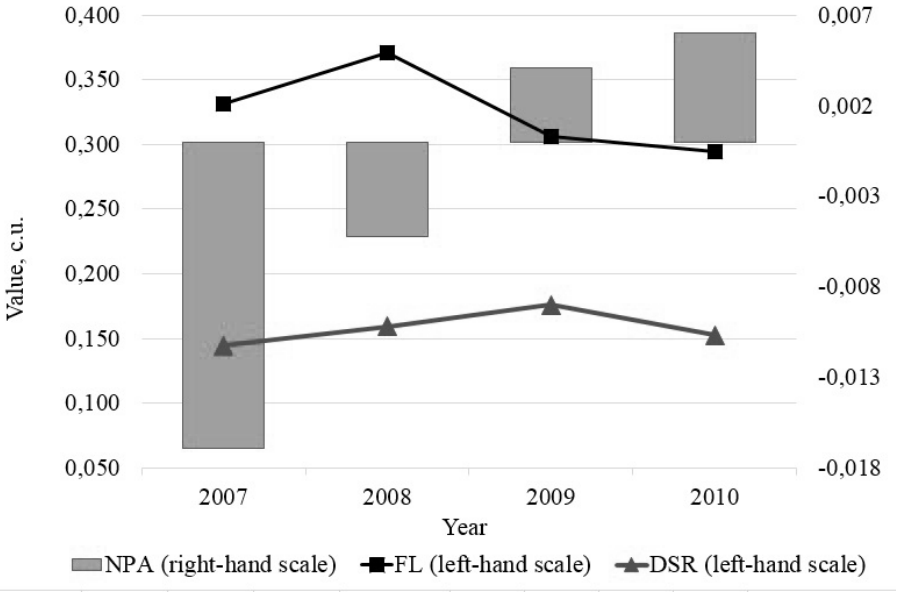
Source: SPARK; authoring

Figure 1
Trends in the indicators with expected negative dynamics, 2007–2010



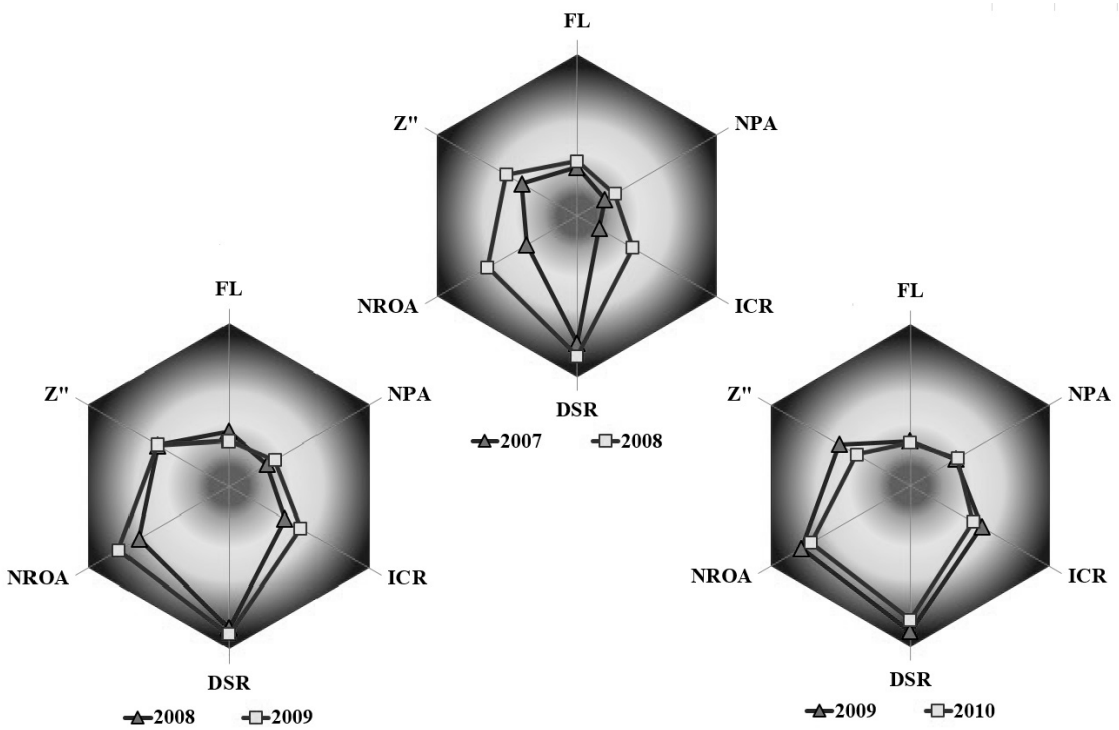
Source: SPARK; authoring

Figure 2
Trends in the indicators with expected positive dynamics, 2007–2010



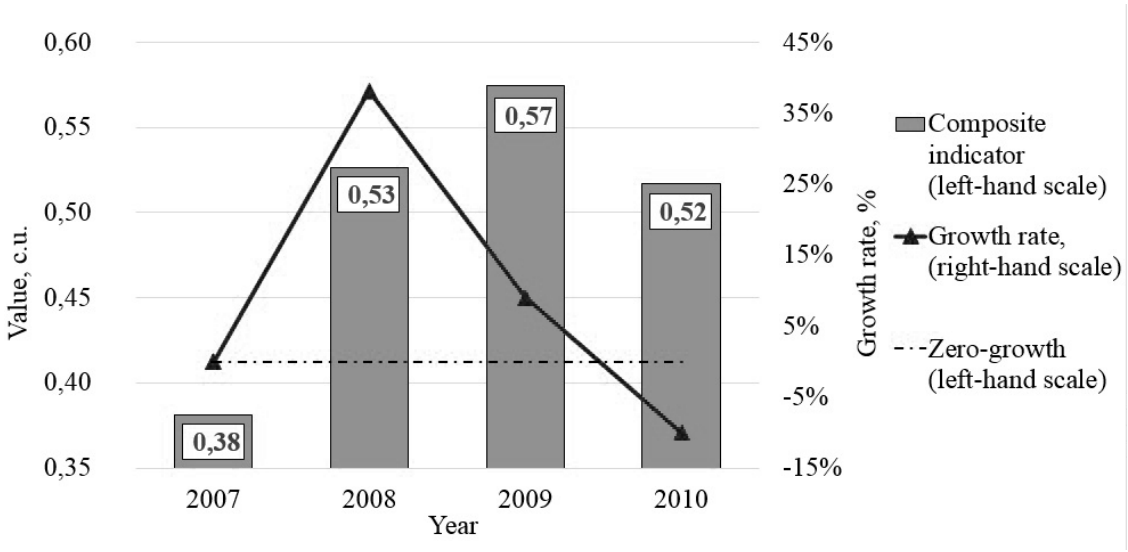
Source: SPARK; authoring

Figure 3
Heat maps of the Russian non-financial companies' risk, 2007–2010, c.u.



Source: SPARK; authoring

Figure 4
The composite indicator of systemic risk of the Russian non-financial companies, 2007–2010



Source: SPARK; authoring

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Финансовая система

ОЦЕНКА СИСТЕМНОГО РИСКА РОССИЙСКИХ НЕФИНАНСОВЫХ КОМПАНИЙ В МОНИТОРИНГЕ ФИНАНСОВОЙ СТАБИЛЬНОСТИ

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Ключевые слова:
финансовая стабильность, мониторинг финансовой стабильности, нефинансовые компании, системный риск, макропруденциальное регулирование

Аннотация

Предмет. Нефинансовые компании как источник системного риска для национальной финансовой системы, проблемы мониторинга финансовой стабильности в рамках макропруденциального надзора и регулирования.

Цели. Разработка методики оценки системного риска российских нефинансовых компаний.

Методология. Использованы общенаучные подходы и методы. Выборка, на которой проверена методика оценки, насчитывает 3 766 компаний в каждом году.

Результаты. Предложена методология оценки системного риска российских нефинансовых компаний, система показателей для его оценки. Выбор показателей соответствует передовой международной практике и доступности данных. Для выбранных индикаторов рекомендуется провести динамический анализ. Предлагается реализовать его как по отдельным показателям, так и комплексно с использованием нового показателя системного риска. Актуальность методики была доказана на эмпирических данных.

Область применения. Результаты могут быть использованы в аналитической практике, в том числе в рамках макропруденциального надзора и регулирования.

Выводы. Предложенная методика вносит вклад в текущую научную дискуссию о новых направлениях оценки финансовой стабильности. Предлагаемые показатели отражают адекватное изменение в исследуемом периоде (год до, во время и после финансовой нестабильности).

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Информация о конфликте интересов

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