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Regulation of Banking Groups and their Financial Stability in Russia

I.V. Larionova, V.A. Byvshev, E.I. Meshkova
Financial University, Moscow, Russia

ABSTRACT

More complex activities, financial reporting, and risk aggregation of banking groups increase the **relevance** of research on their financial stability. **The purpose** of our study is to analyze the effectiveness of banking groups' regulation in the Russian Federation and to develop proposals for its optimization. **The scientific novelty** includes the identification and proof of the hypothesis of the dependence of the banking groups' financial stability on the level of the group control, as well as measures to improve the regulation of activities and financial stability of banking groups in Russia. **The research methodology** is based on a linear model on panel data (fixed effects models, random effects models, and pool models). The empirical base of the study includes data on the 26 largest Russian banking groups and parent credit institutions of banking groups from 2010 to 2020. A hypothesis was put forward that the financial stability of the banking group depends on the effectiveness of the regulatory control within the group. To confirm the hypothesis, the authors assessed the financial stability of banking groups using the Z_{score}, while the banking groups were divided into two pools depending on the level of regulatory control. As a result, this hypothesis was confirmed. For banking groups with a high level of regulatory control, a model of financial stability and the factors that have the greatest impact on it were identified. The authors suggested the following measures to improve the regulation and financial reporting of the banking groups: 1) to expand the regulatory consolidation of the reporting of banking groups to the level of accounting, which will create the basis for a complete risk assessment; 2) to clearly define approaches to formalizing the assessment and management of the forced financial support risks for the group companies; 3) to unify the disclosure by banking groups of information about risks, methods for their assessment and management, including the relationship with the business model of activity. These measures are aimed at improving the risk management of credit institutions.

Keywords: banking risks; regulation; banking groups; systemically important banks; financial stability; control; regulatory consolidation; financial reporting

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INTRODUCTION

There are many factors influencing the process of formation of complex, integration formations — banking groups, the number of which is constantly increasing. For example, N. Cetorelli et al. [1] argue that the achievement of competitive advantages in confrontation with non-bank organizations providing specialized services forces banking groups to expand their activities. Other authors, such as R. Correa and L. Goldberg [2], believe that the key factor in the emerging trend is the introduction of more stringent regulatory restrictions on the banking sector, which encourages banks to provide financial and non-financial services within the banking group.

The purpose of the study is to analyze the effectiveness of regulation of banking groups in Russia in the context of ensuring financial stability and develop proposals for its optimization. Despite the attention of the Regulator to this problem and the availability of scientific papers in this and related areas of research, there are still many unresolved problems and debatable issues. To fill the scientific and regulatory gaps that have arisen, the following innovations are proposed: *firstly*, based on a detailed analysis of the modern system for regulating the activities and risks of banking groups in the Russian Federation, problems have been identified and a set of measures has been developed to eliminate them; *secondly*, using empirical data, an analysis has been made and a comparative assessment of the financial stability, efficiency and degree of risks of the activities of

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parent credit institutions and banking groups in Russia has been given; thirdly, we have carried out statistical modeling and showed the dependence of the financial stability of banking groups on the level of control in the group. The factors influencing stability are revealed and their quantitative estimation is given.

LITERATURE REVIEW AND MAIN RESEARCH HYPOTHESES

According to the purpose of this study, the authors studied domestic and foreign literature in key areas of the subject area.

Development of banking regulation and its main results. Development of banking regulation and its main results. The development of banking regulation is considered by the authors in close connection with the adoption of the Standards of the Basel Committee on Banking Supervision (BCBS) as the basis for national financial stability. Almost all studies over the past thirty years assess the positive impact of banking regulation on the stability of the banking sector and its ability to absorb risks. Thus, the papers of J. Almenberg et al., J.R. Barth, and S.M. Miller [3, 4] show that capital regulation can reduce the likelihood of banking crises. At the same time, it is widely believed that the introduction of new capital standards contributes to a drop in the lending activity of banks D. VanHoose, S. B. Naceur [5, 6] and their effectiveness D. VanHoose, E. Bace and A. Ferreira [5, 7].

Assessment of the financial stability of banks. The financial stability of banks has historically been assessed using indicators that have focused on capital adequacy. Of interest in this regard is the unified methodology of the International Monetary Fund, presented in the document Financial Soundness Indicators: A Compilation Guide.[1] At the same time, the academic environment offers different approaches to assessing the financial stability of banks. Thus, the authors R. Rzayev and S. Babayeva [8] assess financial stability also on the basis of financial indicators, but the list of coefficients is different: capital adequacy ratio, the structure of the client base, its stability, dependence on interbank loans, asset turnover, the level of overdue debt, etc. Others, such as C. Glocker [9], believe that the main signs of a bank default are compliance with capital requirements and the formation of reserves. At the same time, these indicators are calculated, and therefore do not exclude some subjectivity. It is no coincidence that there is an approach that M.M. Ahamed and S.K. Mallick, F. Fiordelisi and D.S. Mare, M. Fratzscher et al. [10–12], in which the financial stability of banks is assessed through the Z_{score}. In doing so, the authors followed the evaluation model previously used by J.H. Boyd et al., L. Laeven and R. Levine [13–14]. The indicator is determined on the basis of financial statements, which minimizes the subjectivity of its assessment:

$$Z_{score} = \frac{ROA_{it} + \left(E_{it} / TA_{it} \right)}{\sigma ROA_{it}}, \quad (1)$$

where ROA_{it} — the return on assets; E_{it} — the balance sheet capita; TA_{it} — the total assets; σROA_{it} — the volatility of the variable ROA_{it}.

We also note that there are a number of studies linking banking stability with external factors, such as market structure and level of competition M. Albaity et al. [15], corporate governance C. Gaganis et al. [16], ownership structure H. Park and B. Oh [17], national culture P. Illiashenko and L. Laidroo [18], institutional environment Y. Fang et al. [19], political and economic uncertainty R.N. Killins et al. [20].

Features of assessing the financial stability (risks) of banking groups. Despite the relevance of this topic, there is a clear lack of research on this topic. The relationship between the organizational complexity of the group and its effectiveness is emphasized in the study by N. Cetorelli and L.S. Goldberg [21], s well as the risk R. Correa and L.S. Goldberg [2], while it is interesting that business diversification within financial groups is not considered as a risk minimization factor in the papers by T. Krause

[1] URL: https://data.imf.org/?sk=51B 096FA-2CD 2–40C 2–8D 09–0699CC 1764DA (accessed on 02.09.2022).

et al., L. Leaven and L. Levine [22, 23]. One of the latest publications on the topic is a study by I. Argimón and M. Rodríguez-Moreno [24], which presents an assessment of the impact of organizational complexity, business complexity, and territorial complexity on the risk of banking groups.

Based on the analysis of the results of the reviewed academic studies, scientific hypotheses regarding the Russian banking sector are formulated.

Hypothesis 1. The financial stability (riskiness) and efficiency of the activities of parent credit institutions and banking groups in Russia are different, which requires an appropriate regulatory response. To evaluate the hypothesis, we analyzed the main financial indicators for the 18 largest Russian banking groups and their parent credit institutions. For the analysis, we used financial reporting data in accordance with Russian and international standards based on the Orbis Bank Focus database [Bureau van Dijk Electronic Publishing (BvDEP)]. Following the approach of [8], we assessed the financial stability of parent credit institutions and banking groups based on asset quality; performance efficiency, and capital provision.

Hypothesis 2. The financial stability of banking groups depends on the effectiveness of control within the group. Among the factors influencing it, there are both external, macroeconomic, and internal, determined by the activities of a particular bank. Following F. Fiordelisi and D.S. Mare [11], we assessed the financial stability of banking groups based on Z_{score} (1). For modeling purposes, banking groups were divided into two pools according to the level of control, which was estimated through the ratio of the number of participants fully consolidated for the purposes of assessing financial stability in accordance with the approach of the Bank of Russia (regulatory consolidation) to the number of companies consolidated for accounting purposes (accounting consolidation) [24]. We analyzed the 26 largest banking groups, divided into two pools according to the level of control. The analysis was carried out on the basis of consolidated financial statements using the Orbis Bank Focus database.

Hypothesis 3. The activities of banking groups in Russia, the effectiveness of control within the groups, as well as the parameters of their financial stability on a consolidated basis, are currently not sufficiently regulated. To confirm this hypothesis, we analyzed in detail the regulatory documents of the Bank of Russia in the field of regulating the activities and financial condition (risks taken) of banking groups.

RESEARCH METHODOLOGY AND DATA ANALYSIS

Fig. 1 presents the research scheme.

Stage 1 formulated the scientific hypotheses presented above.

In Stage 2, we generated statistical data, evaluated and modeled them. *To test the first hypothesis*, we carried out a comparative analysis of the financial stability of parent credit institutions and banking groups based on an assessment of asset quality, performance efficiency, and capital provision.

An analysis of the quality of assets illustrates the difference in indicators for parent credit institutions and banking groups, while in some cases it is quite significant (*Fig. 2*). The share of non-earning loans is, as a rule, higher for parent credit institutions (except for Alfa-Bank and Home Credit & Finance Bank). The same picture is observed in terms of the level of formed reserves.

Efficiency analysis shows an uneven level of indicators for banking groups and parent credit institutions (*Fig. 3*). For example, the parent bank Otkritie Bank has a significantly higher return on assets compared to the group, while the situation is reversed for Home Credit & Finance Bank.

Capital adequacy, which is a comprehensive assessment of financial stability, varies significantly across *parent credit institutions* and groups in general (*Fig. 4*). Thus, this indicator is significantly higher for the banking groups of Raiffeisenbank Rosbank, UniCredit Bank, Home Credit & Finance Bank.

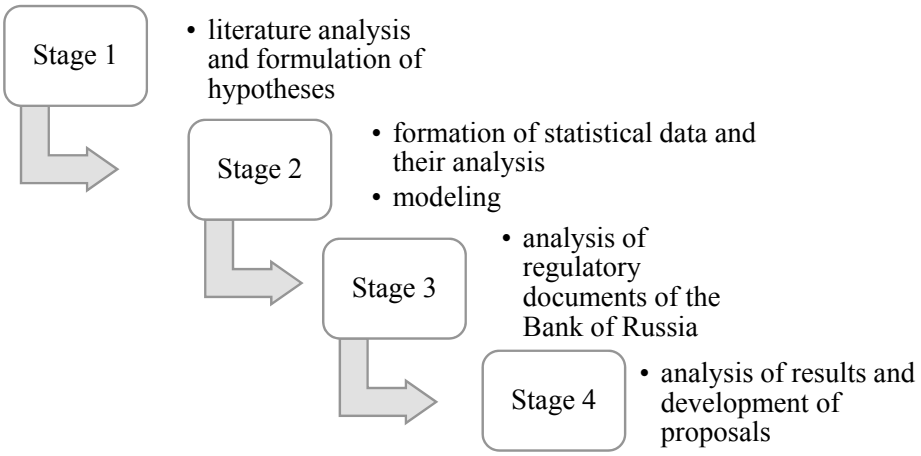

Fig. 1. **Research Scheme**

Source: Compiled by the authors.

To test the second hypothesis, we used the following approach. As noted earlier, we assessed the financial stability of banking groups using Z_{score} (1). This indicator is a simulated (explained) variable (Z_{it}) of the financial stability of the banking group No. $i = 1,2,\ldots,N$ in the time period $t = 2015,2016,\ldots,2020$ гг. The value Z_{it} is determined by the rule (1). Among the factors affecting the financial stability of banking groups, we considered external (macroeconomic factors), as well as internal factors determined by the activities of a particular bank and reflecting its efficiency, asset quality, and business model. Thus, the following variables (2) were taken as explaining the value (1): $NIM_{it} = x_{1it}$ — the net interest margin (%); $CI_{it} = x_{2it}$ — the cost-to-income ratio (%); $LTA_{it} = x_{3it}$ — the loans-to-total assets ratio (%); $LD_{it} = x_{4it}$ — the loans-to-deposits ratio (%); $ILLD_{it} = x_{5it}$ — the share of impaired loans (%); $y_t = x_{6it}$ — Russia's nominal GDP growth rate; $MPR_t = x_{7it}$ — Mosprime Rate; $Oil_t = x_{8it}$ — the Brent oil price growth rate; $D_t = x_{9it}$ — the US dollar exchange rate growth (the growth rate of the US dollar price in rubles).

The values of variables (1) and (2) form a set of panel data

$$\left(\begin{matrix} Z_{it}; NIM_{it}, CI_{it}, LTA_{it}, LD_{it}, \\ ILLD_{it}, y_t, MPR_t, Oil_t, D_t \end{matrix} \right)_{i=1.}^{N=26} \quad (3)$$

The general useful for practice linear model on panel data for the variable (1), taking into account the notation (2), has the form [25, 26]:

$$Z_{it} = \alpha_i + \sum_{j=1}^{9} a_j \cdot x_{jit} + u_{it}. \quad (4)$$

Here u_{it} — random perturbations generated by unaccounted-for factors. They are assumed to be independent of the explanatory variables x_{jit}, centered, uncorrelated, and having a constant variance σ_u^2. Model (4) is called the linear *fixed effects* model (*FE model*). We emphasize that in the specification (4) the absolute terms α_i are interpreted as constants for each banking group $i = 1,2,\ldots,N$.

The second version of the model (4), which is of interest for practice, is based on the assumption that the absolute terms α_i are random variables with a single mathematical expectation μ and a single variance σ_α^2. In such a situation, Model (4) is called the *random effects* model (*RE model*), and its specification can be represented as

$$Z_{it} = \mu + \sum_{j=1}^{9} a_j \cdot x_{jit} + \alpha_i + u_{it}. \quad (5)$$

With such a notation, the component α_i of the random perturbation $\alpha_i + u_{it}$ has a zero mathematical expectation.

Finally, the simplest version of the model (4) is called the *pooling model* and has the form

$$Z_{it} = \alpha + \sum_{j=1}^{9} a_j \cdot x_{jit} + u_{it}. \quad (6)$$

Here the absolute term α is interpreted as a constant for all banking groups $i = 1,2,\ldots,N$. We

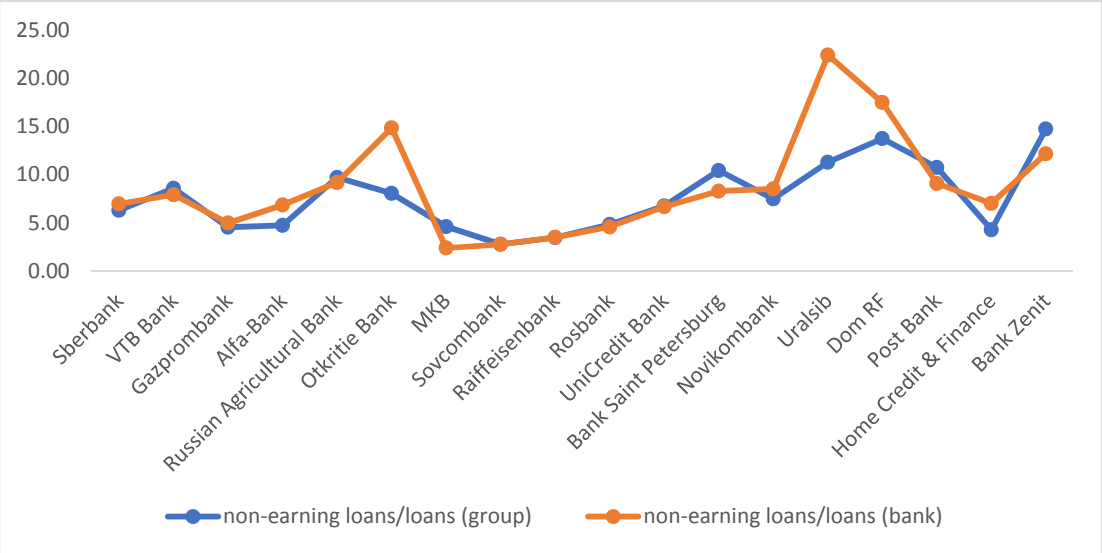

Fig. 2. **Share of Non-Earning Loans by Banking Groups and Parent Banks, 2020**

Source: Compiled by the authors.

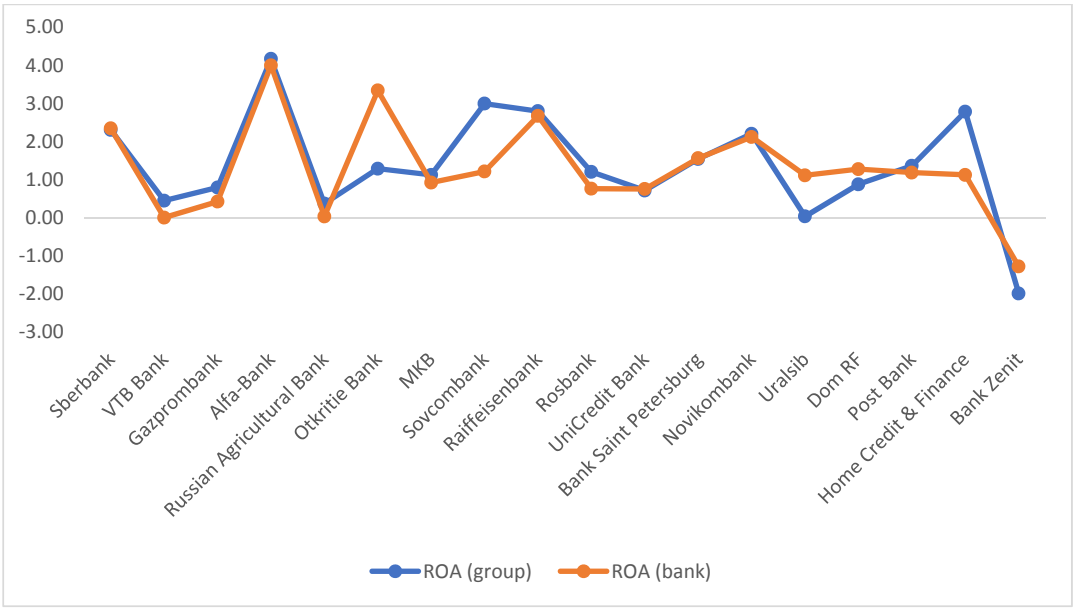

Fig. 3. **Return on Assets of Groups and Parent Banks**

Source: Compiled by the authors.

emphasize that in all cases (4)–(6) the coefficient a_j has the meaning of the expected change ΔZ_{it} of the variable Z_{it} in response to an additional unit of the variable x_{jit} (i.e., in response to $\Delta x_{jit} = 1$). So, the coefficient a_j reflects a partial effect of the explanatory variable x_{jit}.

The task of our study is to reasonably choose one of the models (4)–(6) of the indicator Z_{it} of the financial stability of a banking group and to estimate significant coefficients $(a_j)_{j=1,2,\ldots m}$ of particular influences on the value of Z_{it} explaining variables (2).

The set of panel data (3) is divided into two equal parts (by $N = 13$ banking groups) according to the ratio between the values of the number of participants in the group in accordance with regulatory (RMQ_i) and accounting consolidation ($MSFO_i$). The first included 13 banking groups with sharply different indicators of RMQ_i and $MSFO_i$. The second part included 13 banking

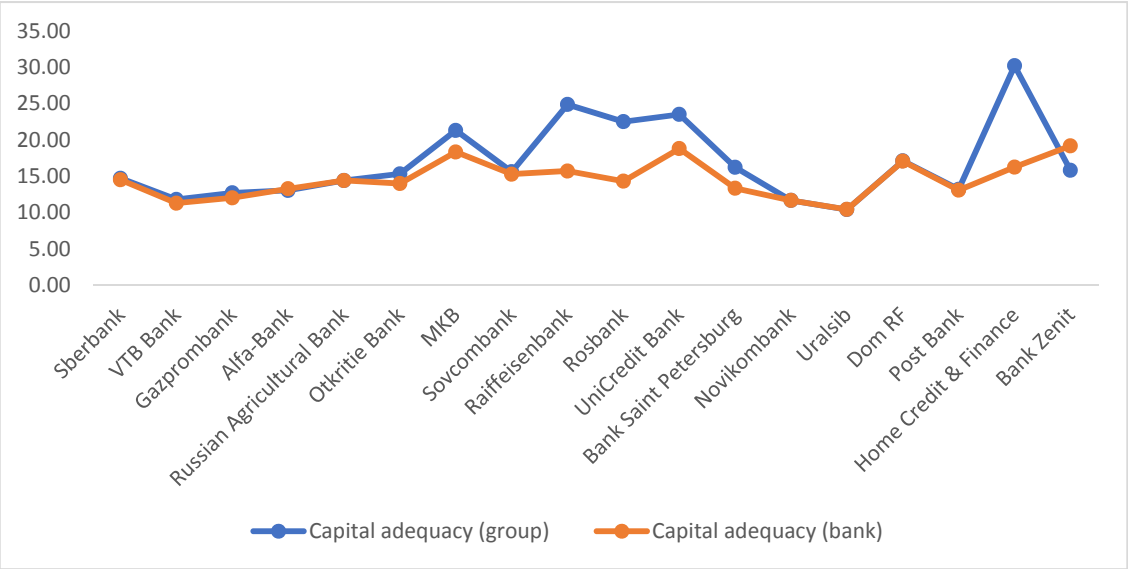

Fig. 4. **Capital Adequacy Ratios of Banking Groups and Parent Banks**

Source: Compiled by the authors.

groups with approximately equal parameters RMQ_i and $MSFO_i$. We emphasize that the first part includes the leaders of the banking sector of Russia in terms of total assets (TA_i): Sberbank, Gazprombank, Alfa-Bank, Russian Agricultural Bank. Based on the division of banking groups into two levels, further, an attempt was made to build models for assessing their financial stability.

Stage 3 is a detailed analysis of the current regulation of the activities and financial condition of banking groups in Russia, formed by systemically important credit institutions, which, taking into account their subsidiaries, control more than 70% of the total assets of the banking system, was carried out.[2]

The analysis showed that the banking group's regulatory reporting often does not coincide with the financial statements along the consolidation perimeter, which does not allow for an adequate assessment of the risks taken by the group. The differences in the consolidation perimeter that we have identified and used in modeling to confirm Hypothesis 2 are due to the approach established by the Bank of Russia Regulation No. 509-P dated December 3, 2014, "On the calculation of the amount of equity (capital), mandatory ratios and sizes (limits) of open currency positions of banking groups". Differences for the largest Russian banking groups are given in *Table 1*.

By regulation No. 729-P dated July 15, 2020, "On the methodology for determining equity (capital) and mandatory ratios, capital adequacy ratios, numerical values of mandatory ratios and the size (limits) of open currency positions of banking groups", the Bank Russia expanded the regulatory consolidation of banking groups but did not bring it to the level of accounting consolidation.

Next, we analyzed the completeness and quality of information disclosed by banking groups on the level of risks taken as part of the implementation of the Bank of Russia Directive No. 4482-U dated August 07, 2017, "On the form and procedure for disclosure by a credit institution (the parent credit institution of a banking group) of information on the risks assumed, procedures for their assessment, risk and capital management".

In Stage 4, we analyzed the results and formulated proposals aimed at improving the regulation of banking groups in Russia and their financial stability.

[2] Banks of Russia Association. The banking system in numbers and graphs. Q2, 2021 No. 2 (12). P. 36. URL: https://asros.ru/analytics/asros/bankovskaya-sistema-v-tsifrakh-i-grafikakh-2–12-ii-kvartal-2021-goda/ (accessed on 10.09.2022).

Table

Number of Banking Group Members Included in the Regulatory and Accounting Consolidation as of 01.01.2021*

Bank	Regulatory Consolidation (ICAAP)	Accounting Consolidation (IFRS)
UniCredit Bank	5	5
Russian Agricultural Bank	4	34
Raiffeisenbank	6	6
Otkritie Bank	21	31
Rosbank	11	11
Credit Bank of Moscow	4	19
Alfa-Bank	4	22
Sberbank	23	377

Source: Compiled by the authors based on the reporting data of the respective banks.

Note: * Latest disclosure date at the time of writing.

RESULTS AND DISCUSSION

Conclusions based on the results of Hypothesis 1 testing. According to the results of the study in terms of analyzing the financial stability of parent credit institutions and banking groups based on an assessment of the quality of assets, performance efficiency, and capital provision, Hypothesis 1 is not rejected. This fact indicates the need to study and regulate the financial stability and risks of banking groups on a consolidated basis (and not only on a sole basis, which is currently being implemented), while it is advisable to study both external and internal factors, determined directly, especially by banking groups.

Conclusions based on the results of Hypothesis 2 testing. On the basis of the structuring of banking groups by the level of organization of control, we attempted to build models for assessing the financial stability of banking groups.

The Z_{it} indicator model of the financial stability of a banking group was originally created for the leaders of the banking sector of Russia in terms of total assets TA_i: Sberbank, Russian Agricultural Bank, Alfa-Bank, VTB Bank, Gazprombank (7). Then an attempt was made to build a model for the entire first part and, finally, a model was created for the second part of the banking groups. Note that for banking groups with a low level of control, a model with a satisfactory explanatory power did not work out.

The estimated model of financial stability of the leaders (7) of the banking sector of Russia turned out to be a model with fixed effects (4) with the following regression equation:

$$\begin{cases} \tilde{Z}_{it} = \alpha_i + 58 \cdot NIM_{it} + 2.5 \cdot LTA_{it} + 4 \cdot y_t - 0.7 \cdot Oil_t \\ \quad (13) \qquad (2.0) \qquad (1.9) \quad (0.35) \\ R^2 = 0.54. \end{cases} \quad (8)$$

In parentheses are the standard errors of coefficient estimates.

Considering (8), we can draw the following conclusions:

1. The main factor that increases the financial stability of the leaders of the Russian banking sector is the level of net interest margin NIM_{it}. Indeed, an increase by one unit (i.e., by 1%) of the value of the variable NIM_{it} entails (with other factors unchanged) the expected increase in the value of $\tilde{Z}_{it}$ by approximately 58 units.

2. The loans-to-total assets ratio LTA_{it} also has a slightly positive impact on the financial stability of the leaders of the Russian banking sector.

3. Russia's nominal GDP growth rate y_t has a noticeable positive effect, while the Brent oil price growth rate Oil_t has a slightly negative impact on the financial stability of the leaders of the Russian banking sector.

Finally, we interpret the value of the coefficient of determination $R^2 = 0.54$. The value of 0.54 means that the correlation coefficient of the real value of the index Z_{it} of the financial stability of the leaders of the Russian banking and the value of $\tilde{Z}_{it}$ calculated by the model (1.8) is approximately equal to $\sqrt{0.54} = 0.73$.

The estimated model of financial stability of the second part of banking groups (banking groups with a high level of regulatory control) turned out to be both a random effects model (5) and a pooling model (6) with the following regression equation:

$$\begin{cases} \tilde{Z}_{it} = 97 - 1.5 \cdot CI_{it} + 11 \cdot y_t - 2.6 \cdot Oil_t - 3.2 \cdot D_t \\ \quad (36)\ \ (0.4)\ \ \ (4.9)\ \ \ (1.1)\ \ \ \ (1.1) \\ R^2 = 0.24. \end{cases} \quad (9)$$

In parentheses are the standard errors of coefficient estimates.

Considering (9), we can draw the following conclusions:

1. The main factor positively affecting the financial stability of the second part of the banking groups is Russia's nominal GDP growth rate y_t. Indeed, an increase by one unit (i.e., an increase in Russia's nominal GDP by 1%) in the value of the variable y_t entails (with other factors unchanged) the expected increase in the value of $\tilde{Z}_{it}$ by approximately 11 units.

2. The cost-to-income ratio rise CI_{it} has some negative impact on the financial stability of banking groups.

3. The Brent oil price growth rate Oil_t has a significant negative impact, and the growth rate of the US dollar price D_t has a significant negative impact on the financial stability of banking groups.

Finally, we interpret the value of the determination coefficient $R^2 = 0.24$. The value of 0.24 means that the correlation coefficient of the real value of the Z_{it} indicator financial stability and the predictive value of $\tilde{Z}_{it}$ is approximately equal to $\sqrt{0.24} = 0.5$.

Thus, we believe that the modeling that we conducted made it possible not to reject the hypothesis that the financial stability of banking groups depends on the effectiveness of control in the group. Indeed, according to banking groups with a low level of regulatory control, we could not build a model to assess the financial stability of Z_{it} with a satisfactory explanatory ability. The exception was the five largest banking groups, a model of financial stability was built for them [a model with fixed effects (4)]. For the second part of banking groups (with a high level of regulatory control), a financial stability model was built, which was both a model with random effects (5) and a pooling model (6).

Conclusions based on the results of Hypothesis 3 testing. The analysis of the current regulation of activities and the financial condition (accepted risks) of banking groups in Russia, and an assessment of information disclosure on the risks of banking groups made it possible to draw the following conclusions.

Firstly, the regulatory reporting of the banking group does not coincide with the financial statements along the consolidation perimeter, which does not allow an external user to obtain an adequate assessment of the risks taken by the group.

Secondly, the IFRS standards for disclosure of information on capital adequacy for banking groups do not require the mandatory calculation of the consolidated amount of capital and risks under IFRS. It is the Group's sole discretion as to which capital adequacy ratio to disclose in these financial statements. Unified standards, unfortunately, have not been established.

Thirdly, the analysis of disclosure by banks of information about the risks they take and their management procedures showed the heterogeneity of data presentation, which is due to the lack of clearly structured requirements for information disclosure. Banking groups also often do not disclose the relationship between the group's business

model and the risks it takes. Considering that a significant number of the group's companies remain outside the perimeter of regulatory consolidation, a significant gap is the lack of formalized requirements for banks to disclose the risks of forced support for companies remaining outside the perimeter of regulatory consolidation.

The identified problems require the appropriate regulatory measures.

1. It seems appropriate to expand the perimeter of the regulatory consolidation of the reporting of banking groups to the level of accounting, which will create the basis for a full account of the risks inherent in the companies of the group.

2. Clearly define approaches to formalizing the assessment and management of the risk of forced financial support for the group's companies.

3. Information about risks, methods of their assessment, and management, including in connection with the business model of activity, disclosed by banking groups, requires unification.

CONCLUSIONS

The conducted research allows us to draw the following conclusions.

1. An analysis of the financial stability of banking groups and parent credit institutions separately led to the conclusion that the level of generally accepted indicators characterizing the assessment of asset quality, performance efficiency, and capital provision differs, and in some cases significantly. This confirms the need both to study the financial stability of banking groups on a consolidated basis and to apply special approaches to regulating their activities.

2. In accordance with the established practice, the regulatory reporting of the banking group does not coincide with the consolidated financial statements along the consolidation perimeter, which does not allow investors and creditors to get a complete picture of the risks assumed by the group. This fact allowed us to assume that the financial stability of banking groups depends on the effectiveness of control within the group.

3. To test this hypothesis, an assessment of the financial stability of banking groups was carried out using the Z_{score} indicator (1). To do this, banking groups were divided into two pools according to the level of control. In total, the 26 largest Russian banking groups were analyzed, divided by the level of control into two pools. Based on the simulation result, one can judge the validity of the proposed hypothesis. Thus, for banking groups with a low level of regulatory control, we failed to build a model for assessing financial stability Z_{it} with a satisfactory explanatory power. For the second part of the banking groups, a financial stability model was built, which turned out to be both a random effects model (5) and a pooling model (6). This made it possible to identify factors that affect the financial stability of groups with a high level of control. The constructed model of financial stability of the leaders of the Russian banking sector turned out to be a model with fixed effects (4). At the same time, the net interest margin indicator has become the main factor that positively affects the financial stability of these groups.

4. Based on the results of our analysis of the regulatory documents of the Bank of Russia in the field of regulating the activities and financial condition (risks taken) of banking groups in Russia, as well as studying their reporting on risk and capital management, measures were proposed to improve the regulation of financial stability and disclosure of information by banking groups about accepted risks.

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ABOUT THE AUTHORS

Irina V. Larionova — Dr. Sci. (Econ.), Prof., Deputy Head of the Department of Banking and Monetary Regulation, Financial University, Moscow, Russia
https://orcid.org/0000-0001-6550-2472
IVLarionova@fa.ru

Viktor A. Byvshev — Dr. Sci. (Techn.), Prof., Department of Mathematics, Financial University, Moscow, Russia
https://orcid.org/0000-0002-8234-4936
VByvshev@fa.ru

Elena I. Meshkova — Cand. Sci. (Econ.), Assoc. Prof., Department of Banking and Monetary Regulation, Financial University, Moscow, Russia
https://orcid.org/0000-0003-3054-1943
Corresponding author:
EIMeshkova@fa.ru

***Authors' declared contribution*:**
I.V. Larionova — analysis of regulatory documents of the Bank of Russia on the research topic, description of the analysis results, and writing of research paper conclusions.
V.A. Byvshev — data preparation, statistical modeling, description of the research results.
E.I. Meshkova — statement of the problem, development of the conceptual framework of the article, critical analysis of the literature, collection, and analysis of statistical data, preparation of research paper conclusions.

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