Topical issues of risk assessment of lending to agro-industrial enterprises

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Abstract. The article outlines the directions of assessing the credit risk of a corporate borrower of the bank, highlights the special importance of lending to agricultural enterprises. The set of credit risk components is analyzed from the perspective of the bank's losses. A variable approach to credit risk assessment using corrective risk factors is described. The essential role of corporate underwriting in the process of credit risk assessment is disclosed.

1 Introduction

The state and forecast of the dynamics and quality of the total bank loan portfolio during crisis and instability periods are always significant and relevant, especially for the corporate sector, which accounts for about 50% of banking assets: over the last twelve-year cycle, the volume of bank loans increased fivefold - from 12.5 to 62.0 trillion rubles, it significantly prevailed over other types of financing [1].

Financing of the agricultural sector is a necessary and important incentive for the economic development of the country's agro-industrial complex. At the beginning of 2024, the loan portfolio of agriculture, fishery, forestry, and hunting enterprises amounted to 3.3 trillion rubles. For the current period of 2024, banks issued 855 billion rubles for seasonal field work, which is 18% higher than in the previous year: in particular, the volume of lending increased mainly due to two main creditors - Rosselkhoznadzor and Sberbank: by 17%, up to 575 billion rubles, and 20%, up to 280 billion rubles. By region, the Krasnodar Territory (94.4 billion rubles), as well as the Rostov and Moscow regions (92.9 billion rubles and 63 billion rubles) became the leaders of loan granting [2].

2 Materials and Methods

Currently, 5 state programs are being implemented in the Russian Federation to support the agro-industrial complex: development of agriculture and regulation of markets, agricultural products, raw materials and food (the state program of agriculture); integrated rural territories

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development (IRTD); effective involvement in the turnover of agricultural land and the development of the reclamation complex of the Russian Federation (the state program Land); development of the fisheries complex; federal scientific and technical program for agriculture development. As part of state support for agricultural enterprises, 545 billion rubles were allocated in 2023, 544 billion rubles of budget funds are planned in 2024, including 22 billion rubles of additional reserved funds, which is due, among other things, to an increase in the key rate of the Bank of Russia and a corresponding increase in compensation to banks providing concessional lending to the sector [3].

As a result of the implemented measures, the quality of the corporate portfolio remains stable today. The growth incentives remain the active implementation of government measures aimed at the structural adaptation of the economy to new conditions and the formation of technological sovereignty, as well as the availability of preferential lending programs. At the same time, negative factors are the transition of a part of the corporate portfolio to potentially problematic debt due to an increase in the debt burden and the persistence of a long period of high interest rates [4]. It should be noted that over the past five years, against the background of the loan portfolio growth, the share of overdue loans has significantly decreased, from 7.7% to 4.1%. The maximum level of overdue debt was noted in 2020 – 7.8% on 01.01.2021; the minimum level – in 2023 - 4.1%. The share of overdue payments to the agricultural sector (including hunting and forestry) also decreased significantly - from 9.1% to 3.4% (Table 1).

Table 1. Comparative data on the quality of loan debt of corporate borrowers by type of economic activity, million rubles [5].

Types of economic activity	01.01.2020	01.01.2021	01.01.2022	01.01.2023	01.01.2024
Total loan debt (LD)	33,249,607.5	37,149,046.4	43,457,812.5	50,844,958.0	64,812,238.0
Total overdue debt (OD)	2,566,167.5	2,915,377.9	2,542,412.6	2,809,116.0	2,671,317.0
Total share of OD, %	7.7	7.8	5.9	5.5	4.1
Mining - LD	1,642,716.0	2,198,927.0	2,488,511.0	3,943,715.0	4,094,188.0
OD	81,400.0	118,224.0	69,856.0	80,272.0	68,626.0
Share of OD, %	5.0	5.4	2.8	2.0	1.7
Processing industries - LD	8,244,619.0	9,463,277.0	9,855,447.0	12,275,084.0	15,554,031.0
OD	573,168.0	553,799.0	542,825.0	420,525.0	399,488.0
Share of OD, %	7.0	5.9	5.5	3.4	2.6
Production and distribution of electric energy, gas and water - LD	1,285,347.0	1,504,914.0	1,485,670.0	1,656,933.0	1,548,930.0
OD	20,617.0	20,386.0	19,907.0	19,341.0	18,716.0
Share of OD, %	1.6	1.4	1.3	1.2	1.2
Agriculture, hunting and forestry - LD	2,009,481.0	2,326,775.0	2,432,974.0	2,808,655.0	2,695,091.0
OD	183,236.0	147,783.0	141,097.0	112,517.0	92,093.0
Share of OD, %	9.1	6.4	5.8	4.0	3.4
Construction - LD	1,326,394.0	1,462,071.0	1,753,822.0	2,893,428.0	3,637,422.0
OD	279,356.0	261,128.0	249,810.0	201,558.0	203,152.0

Share of OD, %	21.1	17.9	14.2	7.0	5.6
Transport and communications - LD	2,207,276.0	2,200,106.0	2,361,130.0	2,362,939.0	3,258,251.0
OD	55,384.0	41,086.0	41,077.0	33,656.0	37,460.0
Share of OD, %	2.5	1.9	1.7	1.4	1.1
Wholesale and retail trade; repair of vehicles, household goods - LD	4,062,982.0	3,662,781.0	3,645,947.0	5,364,815.0	7,262,096.0
OD	442,939.0	415,477.0	432,763.0	391,427.0	358,618.0
Share of OD, %	10.9	11.3	11.9	7.3	4.9
Operations with real estate, rent and services - LD	5,276,465.0	6,382,423.0	6,492,322.0	9,166,334.0	12,457,905.0
OD	442,258.0	490,107.0	483,971.0	567,926.0	514,290.0
Share of OD, %	8.4	7.7	7.5	6.2	4.1
Other types of activities - LD	6,700,781.0	7,756,425.0	7,937,295.0	10,100,485.0	13,914,298.0
OD	266,489.0	304,314.0	302,055.0	966,009.0	961,956.0
Share of OD, %	4.0	3.9	3.8	9.6	6.9
To complete the calculations - LD	300,682.0	284,753.0	304,117.0	272,571.0	390,026.0
OD	14,340.0	15,212.0	15,332.0	15,884.0	16,919.0
Share of OD, %	4.8	5.3	5.0	5.8	4.3

Thus, during the specified period, which included two consecutive crises - pandemic and sanctions - stability was generally maintained and even a decrease in the share of overdue debts in the total portfolio of corporate borrowers was observed, which was mainly ensured by measures of state support for borrowers and significant easing of the Bank of Russia in terms of reserving problem loans.

In this regard, banks face the urgent task of assessing credit losses in real conditions, searching for solutions and criteria for a corporate borrower's rating model to create adequate coverage of bank lending risks as an integral part of banking risk management.

Considering the practice-oriented terminology of Russian banks, in this study, a corporate borrower is understood to be a bank borrower, a legal entity or an individual entrepreneur - a representative of large, medium, and small businesses, including enterprises of the agro-industrial complex (with the exception of credit institutions).

To date, the following areas of assessment and measurement of the credit risk of a corporate borrower of a Russian bank can be distinguished:

1) assessment for the purpose of approving credit transactions and forming a reserve for possible losses within the framework of prudential requirements;

2) assessment of capital adequacy to cover credit risks and implementation of Internal Capital Adequacy Assessment Process to cover risks (ICAAP);

3) calculation and assessment of expected credit losses (ECL) within the framework of compliance with the requirements of the IFRS 9 Standard. The methodology of transition, the problems of transition to IFRS 9 were discussed in an international article by the authors [6].

The basis for the first direction implementation is a comprehensive analysis of the financial and economic activities of the borrower and other classification criteria to determine the loan quality and the formation of a prudential reserve for possible losses. At the same time, the methods of borrower financial assessment chosen by the bank must correspond to the scale of the bank activities [7]. The internal methods of most banks include assessing the borrower creditworthiness using quantitative and qualitative assessment factors with the inclusion of their own set of indicators with their weight value in the formation of a consolidated rating indicator [8]. In the largest banks, the assessment of a corporate borrower is carried out, as a rule, using econometric risk assessment models and calculating indicators: the default probability (PD), the level of losses in case of default (LGD), the cost at risk of default (EAD) [9]. The advantages of this approach are obvious, nevertheless, the analysis of the borrower company to make a decision on lending, assess the level of risk and the size of the reserve created is based on a comprehensive assessment based on a group of indicators that are, to a greater extent, internal risk factors of the enterprise.

The authors consider it necessary to apply a variable approach to assessing credit risk (the algorithm of which is reflected in Figure 2) by including in the system of assessment indicators a set of the following corrective risk factors that allow using predictive data for borrower financial assessment with maximum probability:

- projected GDP growth rate, which is a key indicator of economic growth;
- level of problem debt in the banking sector by industry/type of activity of the borrower - the official indicator of the regulator, which provides information on the realized credit risk in the industry context;
- exposure of the borrower's industry to risks under negative macroeconomic scenarios - a predictive indicator for the implementation of a negative macroeconomic scenario;
- provision of state support measures to the borrower under the current federal programs is undoubtedly a significant factor in the financial viability of the enterprise in conditions of instability.

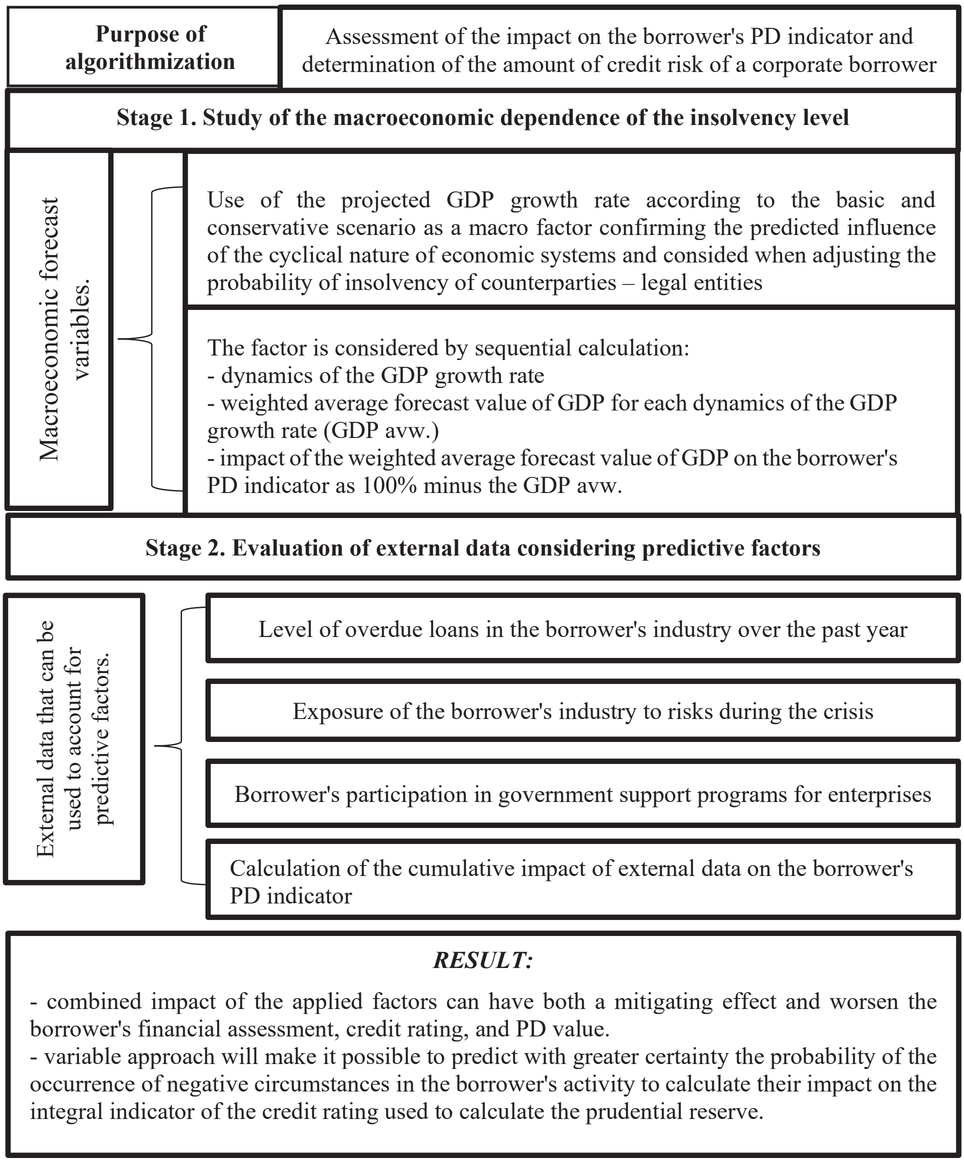

Fig. 1. Algorithm for using a variable approach to assessing the credit risk of a corporate borrower (Compiled by the authors)

The proposed approach will make it possible to predict with greater certainty the likelihood of financial insolvency signs in the borrower's activities to correctly account for the impact of negative factors on the integral level of the credit rating.

The next direction of the bank's assessment of the corporate borrower credit risk is the organization by the bank of ICAAP procedures, within the framework of which the Basel Assessment Standards are implemented in Russia using a standardized approach (SA) and an approach based on internal ratings (IRB approach) [10].

In the first case, bank assets are divided into groups/classes according to the value of the external credit rating, followed by weighting by risk coefficients. Due to the lack of external ratings for most Russian borrowers and their subjective nature, the Bank of Russia implemented two options in Instruction 199 - a simplified standardized and finalized approach by transforming 5 asset groups into 7 classes of counterparties. If there are certain advantages in this approach, there are limitations in the differentiation of assets that do not allow them to be flexibly used in the risk management system.

The advantages of the IRB approach are obvious - achieving not only more accurate parameters for measuring capital adequacy, but also transferring the risk management system to a new qualitative level [11]. At the same time, the costs of implementing PVR models are high, investments and correct settings are required on a long-term basis. Only four Russian banks are allowed to use the approach. According to the requirements of the legislation, from January 1, 2030, systemically important credit institutions are required to switch to the use of internal ratings in assessing credit risk, while other banks must ensure an acceptable level of credit risk assessment based on independent assessment methods.

The third area of credit risk assessment is the reflection in the bank's accounting and reporting of expected credit losses within the framework of the requirements of the IFRS 9 standard [12]. A factor in the emergence of the new standard was the political necessity declared by the G20 as a declaration of incorrect valuation of subprime mortgages, which caused the 2008 crisis. As a result, since 2019, the Russian regulator has introduced a requirement to calculate two reserves simultaneously – a prudential reserve and a reserve under IFRS 9, with the need for a financial assessment of the borrower to measure the amount of loan impairment and the level of credit risk using two different approaches, which often leads to an increase in labor costs, errors, and possible misuses. Later, the regulator prepared recommendations for banks, referring to the best international and Russian practices of applying the standard, among which there is embedding in the models of internal ratings of the borrower's risk metrics based on "verifiable information about past events, current conditions and projected future economic conditions available at the reporting date, etc." [13]. Thus, the addition of the assessment methodology with a block of corrective macrofactors is reflected by a more accurate result in assessing and leveling the risks of lending to the borrower. At the same time, the influence of macro factors can be both improving and worsening the borrower's rating.

3 Results and Discussion

Generalization of the above-mentioned areas of risk assessment of lending to borrowers, including agricultural enterprises, expand the range of components of credit risk as bank losses, including, in addition to actually incurred and recognized credit losses caused by the availability of historical information about the counterparty's activities, reasonable probabilistic future losses. In this regard, the authors consider credit risk as a combination of the following components:

- current risk, assessed on the basis of retrospective information on objective evidence (actual occurrence of an event) of impairment of the borrower's debt, including losses incurred, the reserve for which is actually formed on the basis of losses incurred; conditionally incurred (realized) losses, which with a high degree of probability can be obtained by the bank;
- future risk assessed on the basis of up-to-date, confirmed (including forward-looking) reasonable information indicating the impairment of the borrower's debt, past and current events, as well as forecasts of future economic conditions, including: expected losses estimated from reasonable forward-looking information about losses in relation to the borrower and his debt; unexpected losses, which cannot be fully predicted and are not included in the reserve, but are covered by the bank's capital; stress losses that are not covered by either the reserve or the capital, extraordinary unpredictable losses. A comprehensive

scheme of compositional representation of the corporate borrower credit risk in the context of current and future loss components is presented in Figure 2.

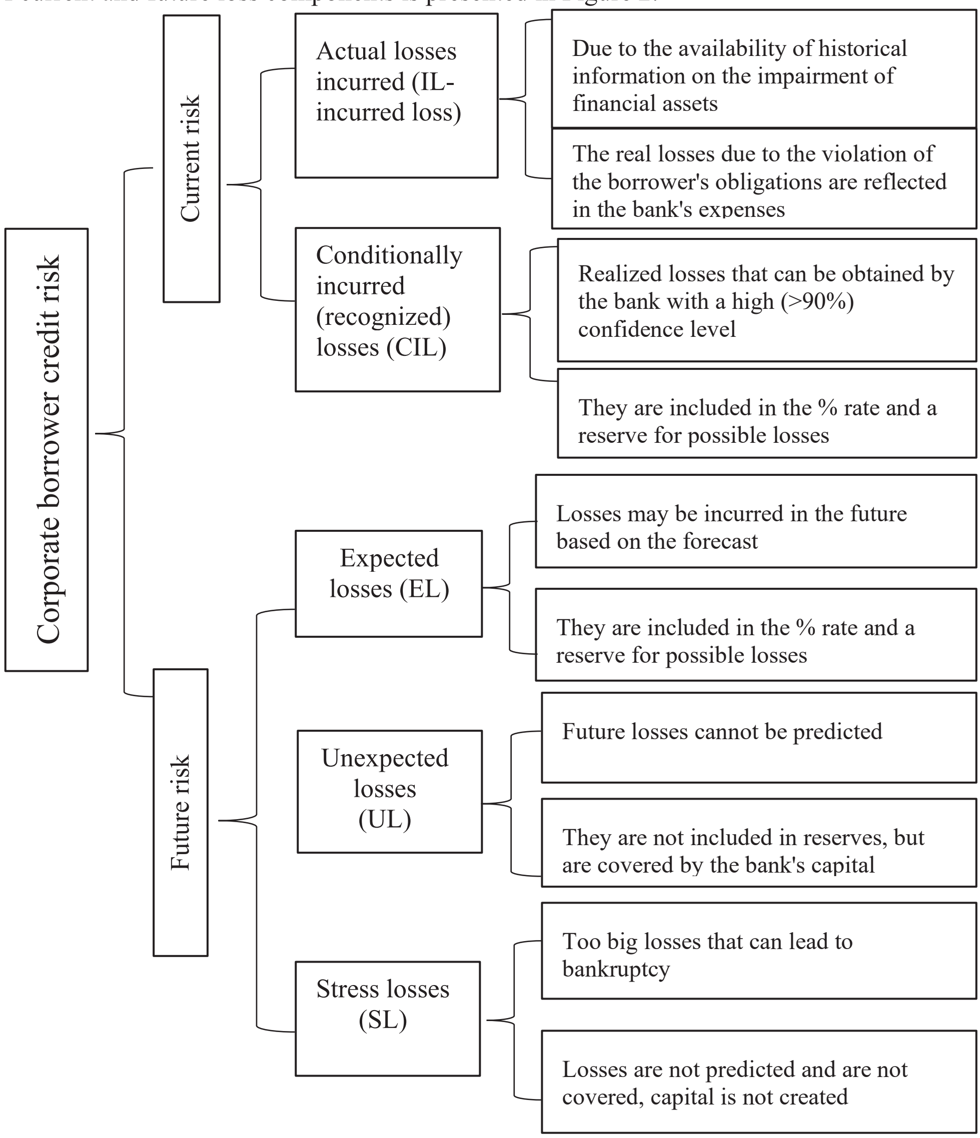

Fig. 2. Complex scheme of compositional representation of the corporate borrower credit risk (Compiled by the authors).

The combination of these credit risk components, from the maximum to the minimum probability of a risk event outcome, considering the analysis of a set of factors, significantly enrich the system of assessment and calculation of the integrated credit risk indicator for its more effective management, which gives a complete understanding of the multifactorial nature of the corporate borrower credit risk, while each risk component individually does not have such properties.

The identification of a set of possible credit risk components in today's conditions is greatly facilitated by the process of banking underwriting, caused by the Basel III standards and is an integral part of modern banking risk management. In Russia, the specialty "underwriter" has existed since the 2000s. Currently, the concept of underwriting is actively used in business, while in scientific and educational literature, this term is mentioned in the context of the credit risk assessment process, mainly when describing retail lending. Based on the conducted research, the authors define corporate underwriting as a process of objective independent examination of a corporate borrower loan application by the bank's risk division (underwriting division), including an assessment of the borrower and his transaction at all stages of the loan, namely: financial assessment of the borrower and his project; identification of potential lending risks in the context of current and future components of credit risk assessment of the degree of their possible impact on the probability of loan non-repayment; confirmation of the probability of borrower default and approval of the rating of the borrower/project and the participants in the transaction; making a reasoned conclusion on the expediency of issuing a loan/changing its terms, structure and parameters of the transaction, the quality of the loan and the level of the reserve for possible losses for approval by the authorized body of the bank**.** Corporate underwriting plays an important role in meeting the regulatory requirements of Russian and international standards, increasing the stability of the financial and credit system.

4 Conclusions

Thus, in the authors' opinion, the improvement of existing models for assessing the measurement of the level of credit risk of borrowers in the most important sectors of the economy, including the agro-industrial complex, is important for the Russian banking system and meets the current needs of financial market participants, especially in the context of a restrictive sanctions regime and its consequences.

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