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Methodological Support for the Analysis of Debt Security in Agribusiness and Measures to Improve Its Level

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Abstract. The relevance of the study lies in the fact that in modern competitive environment for effective business management, the analysis of settlements, namely the state of accounts receivable and accounts payable, which are an integral part of monetary relations and play an important role for risk assessment of the impact on the development of agribusiness is important. The purpose of this study is to improve the methodological support for the analysis of debt security in agribusiness and measures to improve its level as an effective way to manage settlements. Methodological techniques for comparing indicators and ratio analysis techniques were used to analyse calculations. The approaches of scientists to organise the analysis of settlements and debt security assessment in agribusiness are summarised and two phases are highlighted: 1) providing analysis; 2) organising the analytical process. Provisions are determined for the organisation of settlements analysis in terms of tasks, objects, subjects, frequency and stages which include: analysis of structure and dynamics of settlements, analysis of turnover of accounts receivable and payable; analysis of quality of settlements and assessment of debt security. A model of settlement analysis methodology has been proposed with the separation of debt security assessment, accounting and evaluation based on an integral indicator which includes: debt load indicators, structure indicators, quality indicators, and turnover indicators. It has been found that the improvement of methodological support through the introduction of the debt security assessment methodology provides ample opportunities for a comprehensive analysis of agribusiness calculations, enables the identification of threats and is the result of a detailed analysis of calculations. A matrix of measures to improve debt security is considered. The practical value of scientific work lies in the introduction of methods of analysis of settlements with the assessment of debt security, which will control the status of settlements with counterparties, reduce the risk of non-repayment of receivables, determine the need for additional resources to cover accounts payable and contribute to risk reduction

Keywords: calculations, debt, methodology, management, indicators, model, risks

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Introduction

The current stage of economic development is characterised by the fact that the settlement operations of business entities, according to the statistics of the National Bank of Ukraine [1], among the total volume of activity is 80%. The growing volume of settlement transactions generates the need to improve analytical support for their risk management and assessment of the state of debt security of agribusiness enterprises. Studies have shown that about 30% of farms in the agricultural sector are unprofitable, and more than half have overdue accounts payable [2]. Notably, most agribusinesses have traditionally used loans. The prices for purchasing agricultural products for producers are low, which makes it impossible for them to repay their loans on time. In such a situation, it is worth paying particular attention to the indicators that characterise financial security, or more precisely the debt part of it, which requires a timely analysis of the calculations. Therefore, the development of economic analysis and control of settlement operations is one of the important tasks of current and strategic management of an agribusiness enterprise in an unstable business environment.

At the current stage of research, calculations have received little attention as a comprehensive subject of analysis. scientists reveal the sequence of analysis for its individual components – receivables, payables [3]. In competitive conditions, there is a need to improve the organisational provisions of the economic analysis of debt security in terms of justification of tasks, objects, subjects, frequency and stages, which allows structuring the process of managing the calculation of agribusiness enterprises and provides a comprehensive approach to the assessment of their debt security. Revealing the importance of settlement management [4] in the process of evaluating agribusiness enterprises, there is a need for a comprehensive approach to their analysis and allocation of debt security assessment. This approach makes it possible to assess the real size of the debt and identify ways to optimise it. To fulfil the objectives of business management, it is important to analyse settlements, namely the status of receivables and payables, which are an integral part of monetary relations and play an important role in assessing risks and the impact on the development of agribusiness.

Researchers distinguish two approaches to the analysis of financial statements:

1) analytical work in a two-module structure:
 a) rapid analysis of financial and economic activities;
 b) in-depth analysis of financial and economic activities;

2) consistent analysis of the accounting forms, involving calculation of the indicators and comparison of their values with the standards. However, that whichever approach to organising analytical work is chosen in the agribusiness enterprise, calculation analysis will be present in everyone. Despite the outlined importance of settlement analysis for evaluating agribusinesses, scientists have rarely paid attention to a comprehensive approach to its methodology. Researchers mostly dwell on the specifics of analysing the components of the calculation, and in the process of uncovering the methodological steps, they point out the typical steps. Thus, A.N. Ganyuta and R.M. Nafikova [3] in describing the purpose of the analysis of accounts receivable and payable indicate the stages: identifying the dynamics, level, structure and composition of these debts, as well as determining the causes of changes in transactions with debtors and creditors and establishing the degree of influence of such changes on the financial condition of the enterprise. It is not even a question of singling out such an important stage of analysis as the assessment of debt security, because this object at the enterprise level is only given in isolated works. However, this stage, in the author's opinion, is the best way to reveal the state of the company's accounting policy.

Since scientists do not separately distinguish between debt security analysis at the enterprise level, we will analyse the methods for analysing receivables and payables presented in scientific papers. The main characteristics of doubtful and uncollectible debts are given in the monograph [5]. The agribusiness management process needs to maintain a balance between the size of receivables and payables, as non-optimal sizes and ratios are evidence of inefficient use of resources. An analysis of accounts receivable and payable makes it possible to assess the real size of the debt and also to identify measures to optimise it [3]. Therefore, there are all prerequisites to believe that calculation is an important indicator for evaluating the performance of agribusinesses. In the process of reviewing scientific information, it was determined that more attention is given to studying the status, dynamics of accounts receivable than to accounts payable. Thus, to effectively manage settlements, there is a need to improve the methodological support for settlement analysis, particularly with regard to the assessment of debt security in agribusiness and measures to improve its level.

The aim of the study is to improve the methodological support for the analysis of debt security in agribusiness and measures to improve its level as an effective way to manage settlements.

Literature Review

The research of the methodology of analysis of receivables and payables is devoted to the works of many scientists, but at the present stage there is no unity among scientists and practitioners regarding the indicators and the list of stages of analysis. Thus, according to S.V. Kobeleva and O.Yu. Konova, the analysis of accounts receivable should take place in the following sequence [4]:

– analysis of the dynamics, movement and structure of receivables;
– analysis of the quality of receivables;
– assessment of the turnover of receivables;
– analysis of the ratio of receivables and payables.

Among the steps presented, receivables quality analysis as a step in which changes in the share of overdue and doubtful debts that meet agribusiness management requirements are assessed is noteworthy. Notably, O.P. Kolisnyk and I.O. Zamota propose to use such indicators as – the accounts receivable turnover ratio, the duration of receivables period and the specific weight of receivables in total volume of current assets [6] to analyse the quality of receivables. However, these indicators are determined at the stages of analysis of the structure and turnover of receivables, so we cannot agree with the need to attribute the indicators to this stage. The indicators used in the analysis of receivables and the methodology of their calculation are summarised by A.V. Hevchuk [7]. For their part, N.B. Bondarchuk and A.M. Timashova [8] cite the stages of a comprehensive analysis of receivables, including:

– determination of the object of the analysis, the purpose and the main objectives of the receivables analysis at the enterprise;

– collecting and processing sources of information for receivables analysis;

– analysis of receivables at the enterprise (analysis of dynamics, composition and structure, analysis of qualitative condition of receivables, analysis of overdue and uncollectible receivables);

– evaluating the results of the receivables analysis and formulating analytical conclusions;

– management decisions that will improve the efficiency of business operations and reduce the risk of debt default.

As can be seen, no separate analysis of overdue and uncollectible receivables has been identified, indicating that the authors distinguish this type from the analysis of the qualitative condition of receivables.

An interesting approach of T. Payanok, A. Savchenko to the sequence of analysis of receivables, which scientists present as areas of analysis: analysis of total amount level; determination of collection period; analysis of accounts receivable composition; quantitative and qualitative analysis; generalisation of results [9]. In the overall scheme, quantitative and qualitative analysis is presented as one stage, which includes a regression analysis of receivables and other indicators affecting sales revenue; a ranking of the components of receivables; and an analysis of the range of goods that occupy the largest share in the structure of receivables. However, the conducted study would be more informative in revealing the formation of the rating assessment. The authors paid more attention to correlation analysis, which "... makes it possible to assess the effectiveness of management over time, determine the nature of operations and predict future development scenarios" [9].

Regarding the analysis of accounts payable, most authors conduct an evaluation based on horizontal and vertical analysis [10]. Researchers have proposed that accounts payable turnover ratio should be defined as the ratio of sales revenue to the average annual value of accounts payable. However, the above method ignores the fact that sales revenue is also received at the expense of another part of the capital [11]. In the work of L.F. Berdnikov and V.V. Odarich does not specify what value of accounts payable to take for calculation: the average value or the absolute value on a certain date [11]. This all limits the application of the proposed method in practice and makes it impossible to draw conclusions about the status of accounts payable.

The last step in the methodology by S.V. Kobeleva and O.Yu. Konova is an analysis of the ratio of receivables and payables, which is a confirmation that the analysis of these objects should be conducted comprehensively [4]. The same position is held by L.V. Kruchak [12], who points out the spread of this comparison in world practice and its definition as one of the stages of analysis of accounts receivable and payable. Based on the results of this comparison, it is possible to assess the coverage of accounts receivable by accounts payable and to determine the impact on the financial position of businesses.

However, there are a number of scientific papers in which the issue of analysis of receivables and payables is considered comprehensively. Thus, E.I. Kolbasin, emphasising the similarity of the methods for analysing receivables and payables, considers them separately [13]. These techniques include types of analysis such as: determining the share in the total; determining debt dynamics; determining the structure of debt; assessing the condition (quality) of debt; assessing the turnover of accounts receivable and payable.

The same approach is followed by O.K. Yeliseyeva and A.E. Prykhodko [14]. However, the considered methods for analysing accounts payable and receivable do not take into account the features of agribusiness. Thus, despite the considerable work done by scientists, there is no unified position regarding the methodological support for the analysis of settlements in terms of debt security of agribusiness enterprises and measures to improve the level of settlements.

Materials and Methods

The main basis for accounting for settlements with purchasers is UAS 10 "Accounts Receivable", according to which receivables are recognised as an asset if it is probable that future economic benefits will flow to the business and its amount can be measured reliably [15], and UAS 11 "Liabilities" [16], which concerns the determination of payables. To perform the study, it is necessary to use accounting software, including financial statements of PJSC "Khmelnytskrybkhoz", APJSC "Ukraine" and PJSC "Vasyschevo", as well as the breakdown of receivables and payables analytics of these enterprises.

The methodological basis of the study is the general scientific and special methods of cognition. The methods of theoretical generalisation, grouping and comparison are used to analyse settlement transactions. Systematic approach, methods of specification, analysis, synthesis and method of expert evaluations laid down in the basis of improving the organisational and methodological provisions for the analysis of transactions related to the provision of settlement operations of agribusiness enterprises. Using the modelling method, a model of methodological support for the analysis of settlements with the allocation of debt security in agribusiness has been developed and measures to improve its level as an effective way of managing settlements have been identified. The generalisation method and the tabular method were used to generalise the analysis data and visual representation to ensure effective management of settlement operations.

In summary, the analysis of agribusiness calculations mainly uses methodological comparison techniques and ratio analysis techniques. To ensure effective management in today's competitive environment, the management of agribusiness enterprises should not limit itself to the known indicators and study receivables and payables in the analysis of settlements, but should conduct both the assessment of settlements and diagnosis of the level of risks that accompany them on debt security of agribusiness enterprises using the integral indicator.

Results and Discussion

The importance of analysing settlements and improving organisational provisions with a focus on debt security

To timely control the amounts of settlements within the analytical activities of agribusiness enterprises, it is worth monitoring monthly settlements with different counterparties, the causes of debt, special attention should be paid to the amount of overdue accounts payable and receivable, given the features of debt security analysis in agribusiness (Fig. 1).

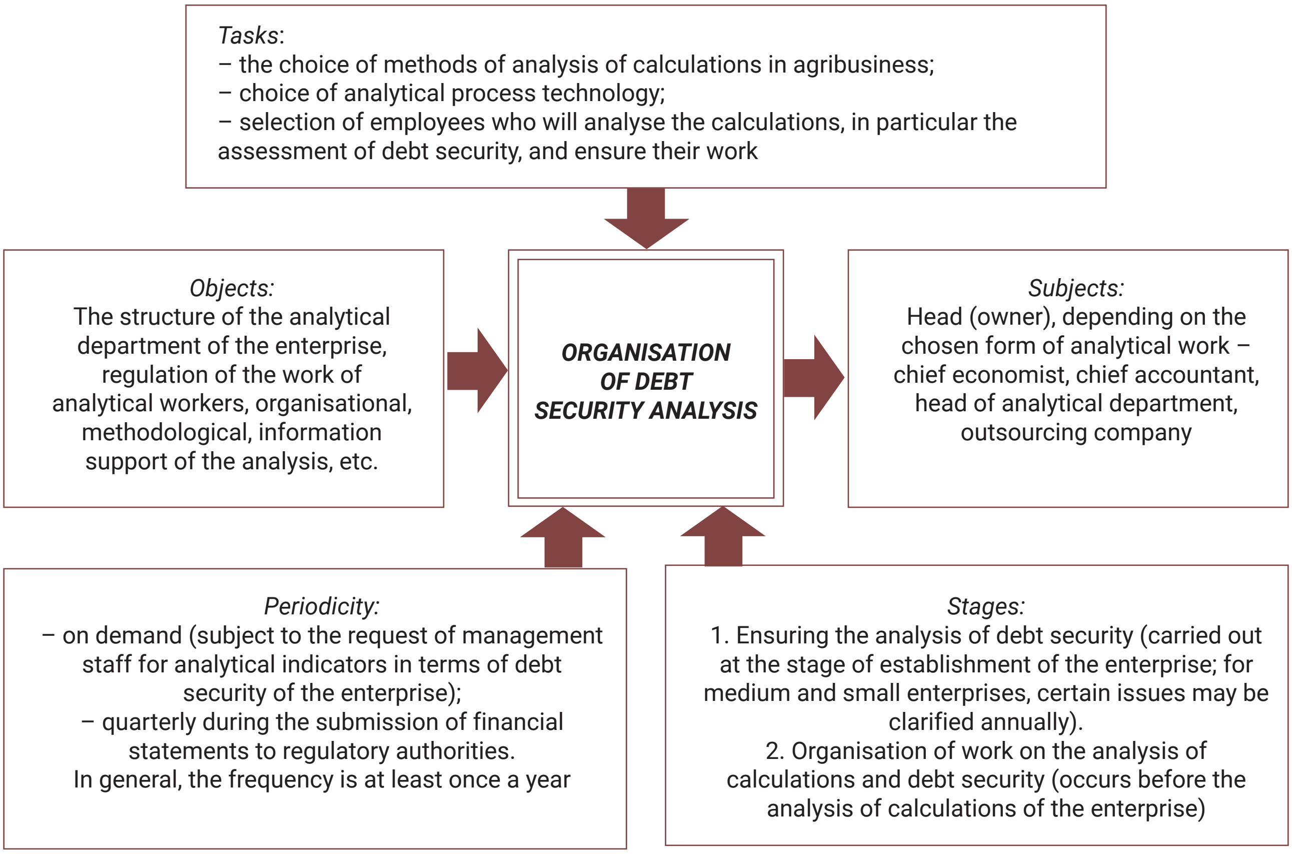

Figure 1. Features of the organisation of the analysis of debt safety in agribusiness
Source: developed by the author based on studies [2; 5; 17]

To conduct such an analysis and exercise ongoing control, an internal control department should be established or a person should be designated with the responsibility to monitor, control and carry out measures to reduce accounts payable and to clear accounts receivable in a timely manner.

We consider it necessary to highlight a number of provisions that define the importance of the calculation indicator as an object of analysis. Firstly, when considering the classification of settlements of agribusiness enterprises, it was pointed out that it is important to take into account such a feature as the impact on entrepreneurial interest, because it is thanks to the timely provision of information about the available volume of settlements by counterparty, the management of agribusiness makes decisions in particular to ensure uninterrupted supply of raw materials, to make adjustments in the process of production. Secondly, the values of accounts receivable and payables are used to calculate many indicators, based on which the financial condition of an agribusiness enterprise is assessed. Thirdly, effective payments management requires a systematic approach, which cannot be reduced to solving individual problems – finding ideal customers and suppliers, court debt collection, and so on. Let us consider the importance of calculation analysis for evaluating the performance of agribusinesses in today's business environment (Fig. 2).

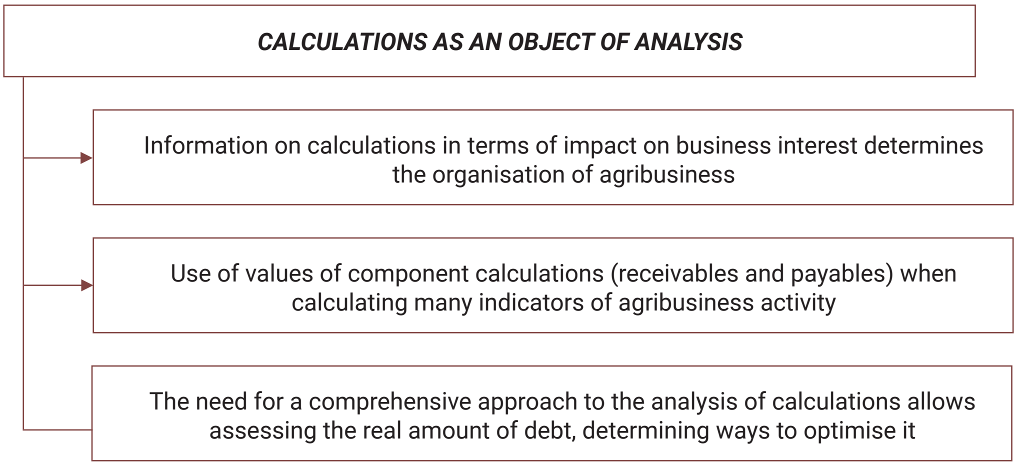

Figure 2. The importance of calculation analysis for evaluating agribusinesses
Source: developed by the author based on studies [2; 5; 17]

Notably, the importance of settlement analysis for assessing the performance of agribusinesses is important in a competitive environment, given the fact that agribusinesses have traditionally benefited from loans. The prices of agricultural products for producers are low, which prevents them from repaying their loans on time – a characteristic of financial security, or, more precisely, of debt security. There are many methods for assessing financial security based on the indicators required to manage receivables and payables, which identify the risks of settlement transactions, primarily manifested in the default of receivables and the identification of customers who are insolvent.

Taking into account the identified contradictions in the authors' proposals, we propose that the sequence of the analysis of agribusiness enterprises calculations should be considered in terms of three stages: organisational, methodological and final (Fig. 3).

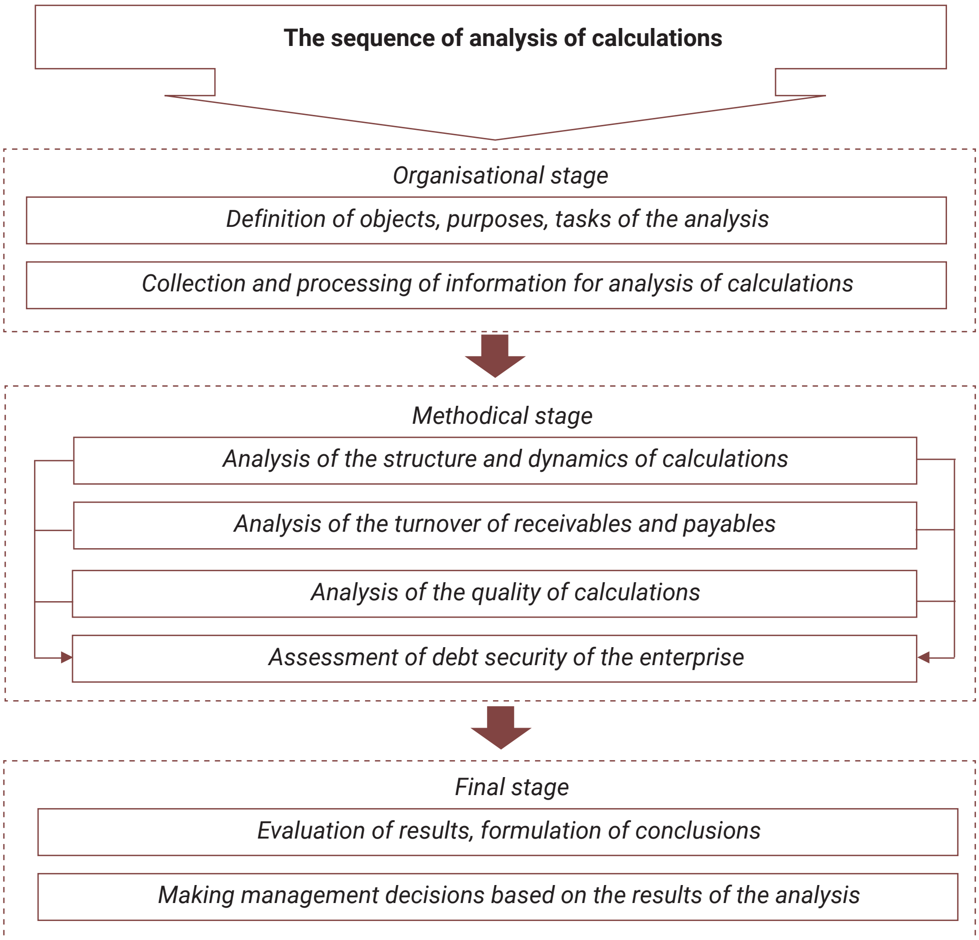

Figure 3. Sequence of calculation analysis in agribusiness
Source: developed by the author based on studies [4, 6; 8]

In today's economic environment, agribusiness is associated with a certain amount of risk. A study of the settlement operations of agribusiness enterprises in Ukraine identified the risks to which settlements are most vulnerable and would have a negative impact on business development (Table 1).

Table 1. Characteristics of the risks inherent in settlement operations (settlements) of agribusinesses

Type of risk	Indicator	Risk characteristic
1	2	3
Currency risk	**CR**	Caused by the depreciation of the Ukrainian hryvnia and exchange rate fluctuations
Industry risk	**IR**	The industry is under state control, which leads to problems with settlements
Inflation risk	**IR**	Debt depreciation due to rising inflation
Climate risk	**ClR**	Adverse weather conditions can have a negative impact on the yield and efficiency of agricultural production
Political risk	**PR**	Political instability negatively affects the country's economic situation, reduces the country's investment attractiveness, makes it difficult to do business and can have an adverse effect on the company's operations
Credit risk	**KrR**	Non-performance of financial obligations by counterparties may have a negative impact on the company's financial condition
Legal (juridical) risk	**JR**	Lack of legal regulation, changes, unpredictable application of legal provisions leading to losses
Interest rate risk	**IRR%**	Changes in interest rates can affect financial performance
Lender's risk	**LR**	Lender's refusal to continue financing
Risk of liquidity	**Rl**	The risk that the real transaction price may be very different from the market price in a worse way; difficulties in repaying the enterprise's financial obligations requiring the transfer of funds or other financial assets
Risk of non-performance by the debtor	**RD**	Shortfall in income and/or compensation for the debtor's unpaid supply debt
Risk of underpayment	**RU**	Under-recovery of funds, resulting in a loss of performance
Risk of personnel (HR)	**RP**	Shortage of qualified staff, failure to provide normal working conditions, lack of supervision of staff (fulfilment of their duties)
Fraud risk (intentional deception)	**FR**	Deliberate acts by a debtor or creditor, or both, to obtain benefits, conspiracy

Source: developed by the author based on studies [2; 5; 17]

To effectively manage the risks of settlement transactions and to justify the appropriateness of a particular risk management method (e.g., self-insurance through the formation of reserves to cover possible adverse consequences of settlement risks, etc.), a scale for assessing the likely consequences of risk has been developed (Table 2).

Table 2. Scale for assessing the level of settlement risk and its probable consequences

Measuring the impact of risk	Impact measurement indicator	% Probability of risk implementation	Characteristics of risk impact measurement
Zero and minor impact measurements	MI_0	0-24%	The impact of the negative impact of risk on the company's financial performance, development and reputation is minimal
Measurement of moderate impact	MI_{mod}	25-49%	The consequences of the risk are not critical to the operation of the business, can be managed or risk transferred to other parties
Measurement of high (significant) impact	MI_{sig}	50-74%	Risk has a significant impact, requires management, and its consequences can disrupt one or more busi-ness processes
Measurement of catastrophic (critical) impact	MI_{cr}	75-100%	The risk and its likely consequences are critical for the company, causing significant losses, damage, losses and causing an exit from the normal state of business processes

Source: developed by the author based on studies [2; 5; 17]

This scale is recommended for use by agribusinesses and takes into account the sectoral averaging of the probability of occurrence of risks specific to their business operations. However, direct use of the scale for assessing the level of settlement risk and the occurrence of possible consequences is not possible without applying the proposed ranking and the translated probability scale for the realisation of settlement risks. Notably, the ranking of the possible consequences of the risks of settlement transactions of agribusiness enterprises should be governed by the company's internal risk management regulations and accounting policies. This is due to the fact that with the help of the developed transfer scale the accountant will be able to assess the probability of the risk on a settlement transaction and to record a contingent liability or contingent asset and form the appropriate collateral (Table 3).

Table 3. Ranking and transfer scale of probability of implementation of settlement transaction risks

No.	Indicator	Normative	Likelihood of settlement risk implementation			
			MI_0	MI_{mod}	MI_{sig}	MI_{cr}
1	**CIR**	**0-0.12**	0-0.02	0.03-0.05	0.06-0.09	0.10-0.12
2	**RI**	**0-0.12**	0-0.02	0.03-0.05	0.06-0.09	0.10-0.12
3	**FR**	**0-0.12**	0-0.02	0.03-0.05	0.06-0.09	0.10-0.12
4	**IR**	**0-0.08**	0-0.01	0.02-0.03	0.04-0.05	0.06-0.08
5	**CR**	**0-0.08**	0-0.01	0.02-0.03	0.04-0.05	0.06-0.08
6	**RD**	**0-0.08**	0-0.01	0.02-0.03	0.04-0.05	0.06-0.08
7	**RU**	**0-0.08**	0-0.01	0.02-0.03	0.04-0.05	0.06-0.08
8	**CR**	**0-0.05**	0-0.01	0.02	0.03	0.04-0.05
9	**KrR**	**0-0.05**	0-0.01	0.02	0.03	0.04-0.05
10	**LR**	**0-0.05**	0-0.01	0.02	0.03	0.04-0.05
11	**RP**	**0-0.05**	0-0.01	0.02	0.03	0.04-0.05
12	**IR**	**0-0.04**	0-0.01	0.02	0.03	0.04
13	**JR**	**0-0.04**	0-0.01	0.02	0.03	0.04
14	**IRR%**	**0-0.04**	0-0.01	0.02	0.03	0.04
	Risk limits		**0-24%**	**25-49%**	**50-74%**	**75-100%**

Source: developed by the author based on studies [2; 5; 17]

Table 3 provides normative values of risk indicators of settlement operations as indicators of their effectiveness, delimits risk zones (zero – there is a serious doubt of risk occurrence; moderate – the probability of risk occurrence is low, but the receipt of negative consequences of risk is doubtful, but can take average values; significant – the probability of risk is high, which leads to mandatory use of risk management measures; critical – risk occurrence

Building a system to manage the risks inherent in the settlement operations of agribusinesses is a complex process that involves an accounting system. A settlement risk management system should be based on interrelated components, one of the most important being the analysis and planning of the settlement status. Thus, analytical support for the risk management of settlement transactions is presented for their groups:

– industry-specific risks (IR, ClR);
– risks caused by government restrictions (CR, LR);
– financial risks (IRR%, CR, IR, Rl);
– organisational risks (RD, FR, RU, RK, KRR);
– personnel risk (RP).

Let's consider analytical support for risk management of settlement transactions in agribusiness (Table 4).

Thus, the main threats to the first two groups of risks are the lack of economically sound support programmes, and the unattractiveness of the industry. In settlement management, a risk assessment of this group will help to understand the structure and dynamics of agribusiness, its specific opportunities and threats to settlement transactions, and improve settlement policy on this basis. This group includes risks that cannot be managed because they arise as a result of the development of the entire economic system. However, this does not mean that they cannot be reduced, so they must be taken into account in the diagnosis of settlement risk in agribusiness. Whereas, the identification of financial and organisational risks is driven by threats such as a lack of investment and financial resources; a lack of reserves; problems in the credit process; and poor organisation of settlements. These groups of risks include those that cannot be managed, but their assessment is simplified because it is based on quantitative indicators.

Table 4. Analytical support for risk management of settlement operations in agribusiness

Management components		Risk group and their indicators									
		Industry specific risks	Risks due to government restrictions	Financial risks					Risks arising in dealing with creditors and debtors		
		IR, CIR	CR, LR	IRR%	CR	IR	RI		RD, FR, RU	LR, KrR	RP
Analysis and planning the settlement status	Areas of analysis	Assessment of buyers' market strength	Analysis of the country's political environment	Balance analysis of receivables and payables in terms of amounts, currencies, terms					Analysis of receivables, identification of dependency on major debtors, assessment of their quality, recoverability	Analysis of liabilities, identifying their concentration and dependence on main creditors	Staff performance analysis
									Debt load assessment		Personnel development assessment
	Quantitative parameters of calculations	Buyers' market strength	–	The interest coverage ratio	Indicators of interest rates and currency exchange rates	Share of revenue denominated in a certain currency	Inflation rate	The current liquidity ratio	Degree of concentration of major buyers /customers	Counterparty credit rating	–
		Product profitability							Accounts receivable turnover period		
		Return on sales							Share of unsecured receivables		
									Share of doubtful debt		
									Amount of allowance for doubtful debts		
									Debt ratio		
	Qualitative parameters for evaluating calculations	Assessment of the level of state support	Assessing access to information on the state of the agribusiness industry	Assessing investment activity					Availability and evaluation of reserves for receivables, reserves for future liabilities, capital reserves		Assessment of the level of organisation of settlement transactions
		Assessment of the level of competition	Assessing of the impact of the state on the enterprise	Availability and evaluation of reserves for receivables, reserves for future liabilities, capital reserves							Assessment of training level
		The value of the enterprise within the region									
	Development of a system of limits / standards	–		Concentration limit on receivables and payables					Accounts receivable limit (broken down by main buyers/ customers)	Limit of borrowed funds used in business activities	–
				Limits on gaps in receivables and payables by terms and types of currencies							
Generation of financial statements		Not provided; an information sheet may be provided		Notes to the annual financial statements (relating to collaterals and provisions)					WFP -1 "Report on the status of settlements with/against payables", WFP -2 "Report on the status of settlements with / against receivables", Management report (in terms of settlement transactions)		–
Development of a system of measures for monitoring the status of settlements		Determined based on the established level of debt security and the main assessment parameters									

Source: developed by the author based on studies [2; 5; 17]

Improving the methodology for the analysis of settlements with a breakdown of debt security

Generalising the scientific approaches and taking into account the state of agribusiness, a methodology for the analysis of agribusiness enterprise settlements is proposed, which differs from the existing ones in a comprehensive approach to the analysis and assessment of enterprise debt security. The proposed methodology covers such a sequence, which takes into account the features of agribusiness, but can be supplemented with other lines of analysis, if necessary, based on the risk diagnosis data of the given enterprise, taking into account the specifics of the activity.

Based on the developed methodological support for analysing the implementation of settlement operations, the author proposed a list of economic indicators for assessing the debt security of an enterprise (*main*: debt-to-assets ratio (I1), net debt-to-assets ratio (I2), debt-to-equity ratio (I3), interest coverage ratio (I4), current liquidity ratio (I5), accounts receivable turnover ratio (I6), accounts payable turnover ratio (I7), receivables-to-payables ratio (I8), payables-to-costs financing ratio (I9) and *additional*: receivables-to-assets ratio (I10, payables-to-liabilities ratio (I11)), which became the basis for calculation of the integral debt security index by applying a comparative assessment score (0-4 – debt security, 5-7 – sufficient debt security; 8-10 – high debt security).

To ensure prompt decision-making in the process of settlement management, in the author's opinion, it is advisable to use the methodology of integral assessment of the debt security of an agribusiness enterprise. Using the indicators derived and substantiated by Iu.V. Skripnik [17] for the agribusiness sector, as well as his proposals for expanding the list of indicators, let us define the order of their integration based on the role in ensuring debt security, which should be understood as a certain level of debt that allows maintaining its financial sustainability to internal and external threats, while maintaining an appropriate level of solvency. Taking into account that the indicators proposed by the author, which determine the debt security of the enterprise, have different units of measurement, we propose to form an integral indicator based on the evaluation of its components' values, where:

– "0" – does not meet the defined criterion;
– "1" – meets the defined criterion for the core indicators.

Furthermore, additional indicators that are evaluated over time need to be calculated. An improvement in the indicator is rated at 0.5, a deterioration at 0. Additional indicators are included in the total estimates. The evaluation of parameters that do not have normative values is subjective, which can be achieved with expert judgement.

Consequently, in the case of total debt security, the integral indicator would be 10.

Summarising the scientific approaches, the author proposed a methodology for the analysis of calculations, which includes an assessment of the debt security of agricultural businesses (Fig. 4).

The proposed methodology, which differs from the existing ones in its comprehensive approach and evaluation of debt security and covers such a sequence that best characterises agribusiness, but can be complemented by other lines of analysis, if necessary, based on risk diagnostic data for a particular enterprise, given the specifics of agribusiness.

Based on the results of the agribusiness settlement risk assessment, the analyst identifies areas for further settlement analysis. The analytical work involved in the calculations requires detailed decision-making routines that allow the benefits and risks to be assessed and compared. This is why the cost-effectiveness of implementing the proposed debt security analysis methodology is determined by comparing the cost of the analysis and the economic efficiency obtained using the results of the analysis. Given the current level of information-computer technology development, the cost of analysis will only be significant at the initial stage of the organisation, when a methodology is proposed in the software. Further costs will be minimal, as automation will not require the agribusiness to spend a significant amount of time and money.

Thus, the application of the proposed methodology for the analysis of accounts receivable and payable, including as a separate step the assessment of debt security, provides a comprehensive approach to management and allows for timely identification of the most problematic areas of the settlements and take appropriate action.

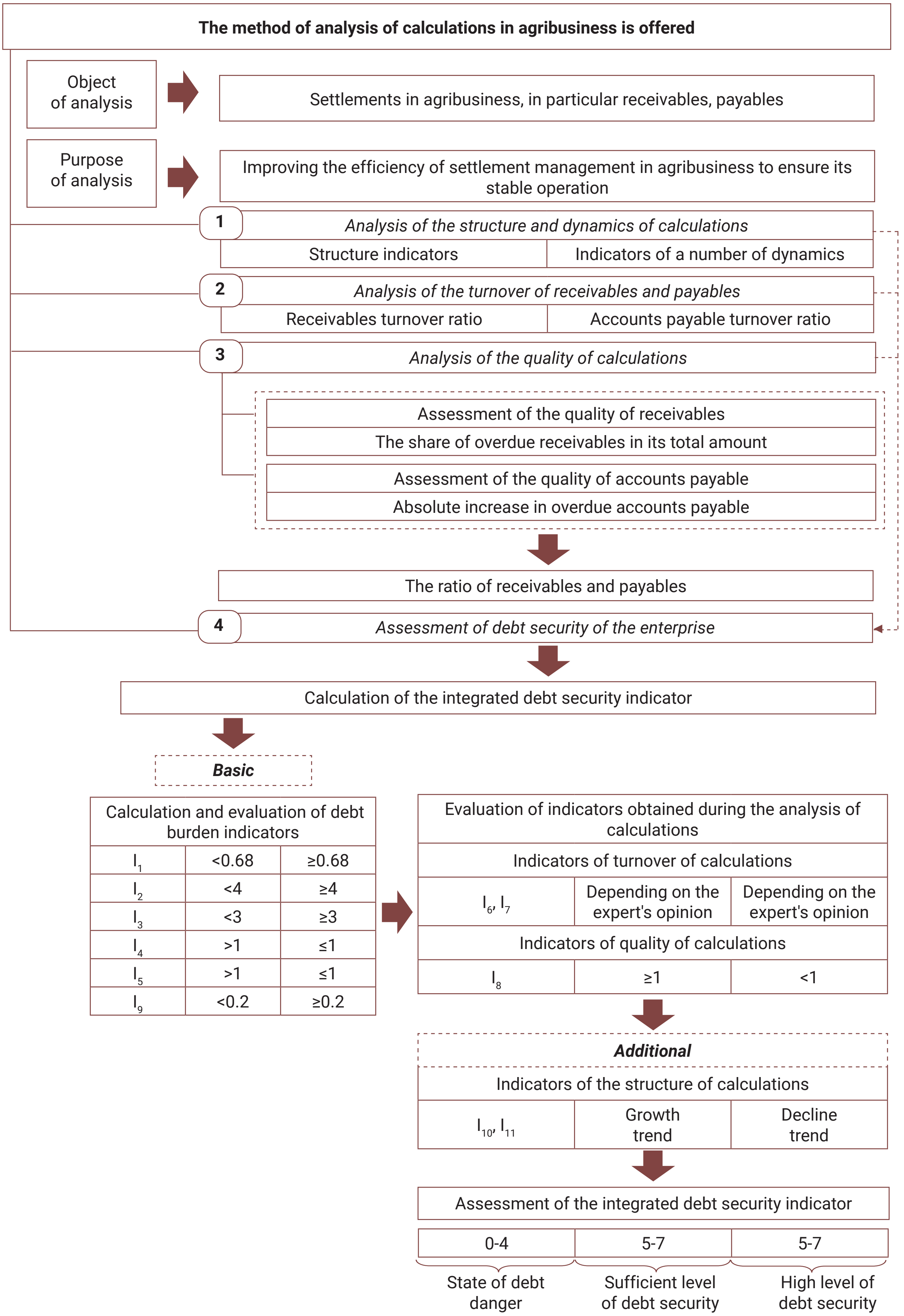

Figure 4. Proposed methodology for analysis of calculations, including debt security assessment

Source: developed by the author based on studies [2; 5; 17]

Practical application of the proposed methodology for analysing debt security in agribusiness and suggesting measures to improve it

The introduction of the proposed methodology will allow assessing the debt security and have, in addition to economic, a social effect, as it will provide a basis for timely settlements and contribute to the stability of agribusinesses, ensuring a steady income for their employees. Consider the calculation of debt security indicators in 2018 based on the studied enterprises (Table 5).

Table 5. Calculation of debt security indicators in 2018

No.	Indicator	PJSC "Khmelnytskrybkhoz"		APJSC "Ukraine"		JSC "Vasyschevo"	
		Result	Rating*	Result	Rating*	Result	Rating*
1.	I_1	1.73	*Negative*	0.15	*Positive*	0.004	*Positive*
2.	I_2	1.74	*Positive*	0.02	*Positive*	0.004	*Positive*
3.	I_3	-1.88	*Negative*	0.57	*Positive*	-0.09	*Negative*
4.	I_4	X	*Negative*	15.26	*Positive*	X	*Negative*
5.	I_5	9.72	*Positive*	6.13	*Positive*	44.48	*Positive*
6.	I_6	1.69	*Negative*	5.08	*Negative*	X	*Negative*
7.	I_7	0.27	*Negative*	6.01	*Negative*	35	*Negative*
8.	I_8	0.29	*Negative*	1.31	*Positive*	0	*Negative*
9.	I_9	0.04	*Positive*	15.27	*Negative*	0.06	*Positive*
10.	I_{10}	2017-0.02 2018-0.03	*Positive*	*2017-0.11* *2018-0.13*	*Positive*	2017-0 2018-0	*Positive*
11.	I_{11}	2017-0.27 2018-0.10	*Negative*	2017-0.02 2018-0.03	*Negative*	2017-0.03 2018-0.04	*Positive*
Debt security level		4	*State of debt danger*	7	*Sufficient level of debt security*	6	*Sufficient level of debt security*

Source: developed and conducted calculations by the author based on data from these companies

In addition, a number of indicators at PJSC "Khmelnytskrybkhoz" have deviations from the recommended values, indicating significant problems in debt repayment and, in general, financial sustainability. A negative profit figure, even in the absence of interest that the company has to repay, does not allow for a positive assessment of the interest coverage ratio.

The changes in the share of accounts receivable are not significant, and the share of accounts payable has decreased, which allows giving the maximum score in the evaluation of additional debt security indicators at PJSC "Khmelnytskrybkhoz". The situation of additional debt security indicators at APJSC "Ukraine" is similar to that at PJSC "Khmelnytskrybkhoz". Whereas at JSC "Vasyschevo" there are no accounts receivable at the end of the reporting period, this situation is dictated by the general policy of working with debtors and maximum sales of products against prepayment. The changes that characterise the share of both receivables and payables (additional debt security assessment indicators) are insignificant, and the indicator remains at the beginning of the period under investigation and at the end within the normal range.

To assess the integral indicator, it is necessary to use a scale (Table 2) that has been developed based on a synthesis of the work of scientists who have investigated the issue of assessing the components of economic security (which has enabled the definition of states of debt security), and modelling situations and consequences for indicators that do not meet the established criteria. The normative value of the turnover ratios for accounts receivable and accounts payable depends on the specifics of a particular agribusiness enterprise, so these indicators have not been taken as the main ones for determining the scale of debt security. In fact, they are subjective in nature. Furthermore, additional indicators were also not taken into account, as their impact is significantly less than that of the main indicators.

However, a negative value of receivables (payables) turnover ratios and additional indicators combined may worsen the value of the integral indicator of debt security, thereby moving it to the line between sufficient debt security / at risk or between sufficient debt security / high debt security. The debt security indicator is assessed by applying a scoring scale, as follows:

0-4 – state of debt danger;
5-7 – sufficient level of debt security;
8-10 – high level of debt security.

Consequently, the value of the integral indicator of debt security for PJSC "Khmelnytskrybkhoz" is 4, for APJSC "Ukraine" it is 7, and for PJSC "Vasyschevo" it is 6. The resulting value of the integral index indicates a sufficient level of debt security at APJSC "Ukraine" and PJSC "Vasyschevo". As a result of a detailed analysis of the agribusiness calculations, the measures of the stabilisation and debt security programme can be used. Consider the matrix of measures to improve debt security in agribusiness enterprises (Table 6).

Table 6. Matrix of measures to improve debt security in agribusiness

Indicators / Type of debt security	Debt burden indicators (I_1, I_2, I_3, I_4, I_5, I_9)	Indicators of the structure and quality of calculations (I_8, I_{10}, I_{11})	Turnover indicators (I_6, I_7)
State of debt danger (0-4)	Continuous monitoring of accounts payable status; reduction of accounts payable by scheduling payments; increase in cash through continuous work with debtors; adjustments in the formation of reserve capital	Continuous control of the payment status; reduction of accounts payable by scheduling payments; establishment of a credit limit for customers	Increasing sales through the use of new equipment and technologies
	+ measures for the level that characterises the highest type of debt security		
Sufficient level of debt security (5-7)	Monitoring the timeliness of loan repayments; making provisions for expenses and payments; increasing retained earnings	Constant work with debtors; analysis of creditworthiness of counterparties, assessment of creditworthiness of new potential buyers and customers; development of business processes for initiating claims work with buyers and customers in case of violation of payment terms under the contract	Increasing sales by expanding the customer base; constant work with debtors
	+ measures for the level that characterises the highest type of debt security		
Sufficient level of debt security (8-10)	Increase cash flow by dealing with debtors on an ongoing basis	Improving the reputation of an agribusiness enterprise	Monitoring of receivables for arrears

Source: developed by the author based on studies [2; 5; 17]

The implementation of most of these measures in practice involves changes in the organisation of the accounting system, as well as in the recording of transactions. In particular, decisions can be made to write off uncollectible receivables based on the results of settlement monitoring, as well as adjusting the methods for calculating the allowance for doubtful debts and/or reviewing the way the doubtfulness factor is calculated. It is compulsory for changes to be indicated in an accounting policy order with appropriate justification.

Thus, properly organised settlement analysis of agribusiness enterprises allows controlling the status of settlements with counterparties, reduce the risk of default on receivables and overdue debt formation, as well as to determine the need for additional resources to cover accounts payable.

Conclusions

Having summarised and evaluated the approaches of scientists in organising debt security analysis in agribusiness, two stages were identified:

1) providing analysis (determining the form of analytical work; drawing up a comprehensive plan of analytical work; writing methods of analysis; determining ways to provide analysis results);

2) organisation of the analytical process (development of a plan and programme for debt security analysis, allocation of work among the performers, identification of sources of information for analysis; diagnosis of risks of settlement operations based on Risk Passports, evaluation of the proposed methodology in accordance with the conditions for analysis and its adjustments).

For methodological support of the analysis as one of the important factors of effective management of debt security, provisions for the organisation of agribusiness debt security analysis in terms of objectives, objects, subjects, frequency and stages have been outlined. The stages of settlement analysis include: analysis of settlement structure and dynamics, analysis of turnover of receivables and payables; analysis of settlement quality and assessment of debt security. The most attention is paid to the analysis of debt security of the enterprise, which is proposed to be assessed based on an integral index, the calculation of which includes indicators from such groups as debt load indicators, structure indicators, quality indicators, turnover indicators. The proposed methodology for assessing the debt security of agribusiness enterprises provides ample opportunity for a comprehensive analysis of agribusiness settlements and enables the identification of threats. One of the advantages of this technique is to bring the indicators into a comparative view by applying a scoring system to diagnose the level of debt security of agribusiness enterprises. As a result of a detailed analysis of the calculations, individual measures of the programme to stabilise and enhance agribusiness debt security can be used. Further research is planned to develop a risk management model tailored to agribusiness and to develop an action programme to improve debt security, which will contribute to better management of settlements.

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Методичне забезпечення аналізу боргової безпеки в агробізнесі та заходів щодо підвищення її рівня

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Анотація. Актуальність дослідження полягає в тому, що в сучасних конкурентних умовах для ефективного управління бізнесом важливе значення має аналіз розрахунків, а саме стан дебіторської та кредиторської заборгованостей, які є невід'ємною частиною грошових відносин і відіграють вагому роль для оцінки ризиків щодо впливу на розвиток агробізнесу. Мета наукової роботи – вдосконалення методичного забезпечення аналізу боргової безпеки в агробізнесі та заходів щодо підвищення її рівня як ефективного способу управління розрахунками. Використано методичні прийоми порівняння показників та прийоми аналізу коефіцієнтів щодо аналізу розрахунків. Узагальнено підходи науковців щодо організації аналізу розрахунків та оцінки боргової безпеки в агробізнесі і виділено два етапи: 1) забезпечення аналізу; 2) організація аналітичного процесу. Окреслено положення організації аналізу розрахунків в частині завдань, об'єктів, суб'єктів, періодичності і етапів до складу яких віднесено: аналіз структури та динаміки розрахунків, аналіз оборотності дебіторської та кредиторської заборгованості; аналіз якості розрахунків та оцінку боргової безпеки. Запропоновано модель методики аналізу розрахунків з виділенням оцінки боргової безпеки, яка має вплив на бухгалтерське відображення та оцінку на основі інтегрального показника, який включає: показники боргового навантаження, показники структури, показники якості, показники оборотності. З'ясовано, що удосконалення методичного забезпечення шляхом впровадження методики оцінки боргової безпеки надає широкі можливості для комплексного аналізу розрахунків в агробізнесі, дає змогу визначити загрози та є результатом деталізованого аналізу розрахунків. Розглянуто матрицю заходів щодо підвищення рівня боргової безпеки. Практична цінність наукової роботи полягає у запроваджені методики аналізу розрахунків з виділенням оцінки боргової безпеки, яка дасть змогу контролювати стан розрахунків з контрагентами, знизити ризик неповернення дебіторської заборгованості, визначити потребу в додаткових ресурсах для покриття кредиторської заборгованості та сприятиме зменшенню ризиків

Ключові слова: розрахунки, заборгованість, методика, управління, показники, модель, ризики