Accounting and analytical aspect of risk management of agricultural organizations

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Abstract. In modern conditions of economic development, agricultural organizations are faced with the need to manage their property and obligations in situations of risk and uncertainty. Accounting and analytical support is becoming an important source of information for making effective management decisions. An important stage of management at all levels is control. Effective control is not possible without consideration and analysis, which causes certain difficulties. The risk management system works with all identified risks of the organization. The accounting system covers a limited number of risks with the necessary parameters for their registration and acceptance for accounting. When registering risk, each type of accounting (financial, management, tax, statistical) is determined by its goals, uses different methods of assessment, etc. The reporting in each case meets specific criteria. Differences in the principles of accounting and assessment of one risk in several accounting systems cause difficulties in the practice of risk management. The risk management process has its own procedure regulated by international and national standards for risk management, which do not contain unified actions regarding further accounting measures for identified risks. This leads to a decrease in the quality of information regarding risks to ensure control and management procedures. At the same time, accounting standards do not provide for management actions for risks accepted for accounting. This paper is devoted to the study of the role of accounting and analytical aspects in the risk management of agricultural organizations from the position of coordination of control actions of risk management and accounting procedures. General scientific methods were used in the study: a systematic approach, comparative analysis, logical generalization, modeling, etc.

1. Introduction

The economic environment in which the enterprise operates is characterized by continuous development, the generation of new components, the transformation of existing ones, and the strengthening of the relationships between them. The modern economy has a tendency to strengthen foreign economic integration, international cooperation in the field of trade and production, scientific and technological development, and research. Business entities operate in an ever-changing regulatory
framework, the emergence of new business entities, the development of settlement systems with counterparties, and increased competition. The influence of uncertainty and risks is amplified. Uncertainty is manifested in the unpredictability of events, i.e., one cannot confidently say in advance whether a certain event will occur in the future (fluctuations in exchange rates and credit rates, natural phenomena, political events, scientific discoveries, etc.), it is only possible to make assumptions based on the available information. Economic entities are in a state of uncertainty regarding the consequences of decisions made, despite the information available in the financial statements, which provides the monitoring process with the necessary data to analyze the facts of economic activity.

The State Program for the Development of Agriculture and Regulation of Agricultural Products, Raw Materials and Food Markets for 2013-2020 emphasizes that agricultural enterprises occupy an important place in the economic life of our country, as they provide food security for the population and are also the raw material base for export operations. The efficiency and effectiveness of agricultural production reflects the success of the entire national economy. At the present stage of development, the efficiency of agricultural organizations has gained particular importance in the context of economic sanctions and the state course on import substitution.

Agricultural enterprises feel the need to modernize and increase production, diversify their products with increasing demands on their quality. At the same time, the efficiency of using available resources (financial, natural, labor, etc.) holds not the last place. The agricultural industry is one of the most unstable sectors of the economy, since in addition to the impact of economic laws inherent in all economic entities, it is subject to the influence of specific risk factors: climate, weather conditions, epidemics, environmental problems, etc. A competitive advantage for agricultural enterprises can be the creation of a system of quantifiable performance indicators, which along with accounting data will help to adjust not only the business strategy as a whole, but also prevent risk situations.

The scientific development of risk management has historically occurred in various economic areas (especially in industry, commerce, banking). This problem became widespread after the Second World War and does not lose its relevance at the present time. The works of such scientists as W. Snyder, R.I. Mayor, B.A. Hedges describe the need for an integrated approach to risk, defining the principles and steps of risk management and expanding the only approach that existed at that time - insurance [1]. H. Markovitz, W. Sharpe, J. Lintner developed risk management concepts in the context of managing the investment portfolio and financial assets of commercial enterprises [1]. Further development of credit and financial risk management is reflected in the works of F. Black, M. Scholes and others.

The subsequent development of risk management was carried out in the direction of developing common concepts, general principles and terms. In international practice, there is an increase in the degree of uncertainty in decision-making, since the development of scientific and technological progress accelerates the dynamics of economic processes and technical capabilities. The vector of research in this area is aimed at the formation of a unified risk management system that reflects the increasing influence of uncertainty situations on goals. There is a determination of the place of risks in the system of scientific papers. The practical application of the achievements of scientific thought is expressed in the standards and concepts for risk management adopted by international and national organizations and societies. Currently, national risk management standards have been developed in the following countries: Australia, New Zealand, Canada, Japan, Great Britain, Norway, Austria, etc. In the United States and Russia, there are standards adopted at the state level and prescribing the mandatory execution by business entities [2, 55].

In modern conditions, all organizations (regardless of their form of ownership or sphere of activity) are affected by many risk factors due to internal circumstances and the impact of the external environment. Agricultural enterprises are no exception.

The production and sale of agricultural products is most associated with the likelihood of situations leading to loss of profit, financial instability and bankruptcy. This can be explained by the fact that the volume of agricultural output is influenced not only by the volume of investments, labor costs, but also by the objective climatic conditions and biological laws, so investing in this sector of the economy is quite risky.
For a comprehensive study of the risks of agricultural organizations, it is advisable to list the problems that have the maximum impact on the production process at present. Among the most significant threats are the following: the high cost of energy resources; insufficient level of state financing; lack of qualified staff; currency risks; risk of commodity price changes; administrative, trade, economic barriers; logistic problems; unattractiveness of the industry for foreign investors; geopolitical risks and other risks [3].

2. Methods

The nature of the risk is characterized by the ambiguity of future events, suggests the lack of achievement of goals and solutions to business problems. At the same time, it is possible both a negative development of events (diseconomies and losses) and a positive one (over-fulfillment of planned indicators, an innovative breakthrough, an increase in consumer demand for a new product, breeding of new plant varieties (animal breeds), expansion of opportunities, etc.). Accordingly, the need to control risk, to be able to influence its consequences, to manage risk is quite natural [4]. The control mechanism will reduce the negative consequences of risk and solve the situations of uncertainty with minimal losses.

Control involves monitoring the managed system to ensure its optimal functioning and regulation of managerial actions. Control is based on the analysis of reliable and complete information about events affecting the financial and economic activities of the organization. An important source of such information is accounting and analytical support. Scientists such as N.V. Sirotkina, G.V. Golikova, and T.D. Romaschenko drew attention to the fact that functional analysis and cost analysis can optimize the organization’s production system when introducing innovation, changing the range of products, organizational changes [5, 1792]. It can be assumed that the strengthening of the risk-oriented accounting systems of agricultural enterprises can be carried out similarly.

An analysis of the scientific works of Russian authors allows concluding that the methods of mathematical modeling and statistical analysis are mainly used for risk assessment from a management perspective [6, 118]. The following key areas of research can be distinguished: general theoretical models and conclusions; practical recommendations of a managerial nature; classification principles and assessment methods; reflection of risks in the accounting and reporting systems of the enterprise; study of internal economic risks at various stages of business processes of enterprises of various fields of activity.

This study is aimed at assessing relationships and identifying inconsistencies in risk accounting and management under existing conditions.

3. Results

Most scientific publications on risk accounting do not consider risk itself, but rather risk management, especially in the context of enterprises in the agricultural sector of the economy. An important place is given to accounting for the consequences of risk implementation in accordance with accounting standards (non-return of receivables, sanctions on overdue payables, changes in tax legislation, sharp fluctuations in exchange rates, etc.). The types of risks listed above are objects of accounting, and, as a rule, do not have systematized clear rules for responding to risk and managing it (lack of standardized procedures) by decision makers. It should be noted that such risks are not indicated in the regulatory documents on risk management that are compiled by international and national economic structures in order to standardize risk management (AIRMIC, ALARM, IRM:2002, ISO/DIS 31000, PMI, AS/NZS 4360:2004, COSO ERM 2004, COSO ERM 2017 and others [7]). It turns out that the records are kept, but the management of the listed risk categories in accordance with the standards is not provided.

In the field of risk management, standards consolidate a unified conceptual framework, determine the rules and approaches to the formation of the organizational structure of the risk management system. Standards contain the rationale and determine the need for their creation, as well as rational recommendations for practical implementation and application in enterprises. Using standards helps to solve the following problems: ensuring simplicity and openness of the risk management system based on standards for internal and external users; opportunities to reduce the costs of building and optimizing
a risk management system; stimulating the development and active use of outsourcing in developing a risk management system; ensuring the functionality of the process of sharing information on risks between counterparties, etc.

The study of standardized risk management models at the enterprise allows highlighting their common points, without which it is impossible to carry out risk management (Fig. 1.). An important point is the fact that the risk accounting stage is absent in risk management standards.

The influence of risks always leads to a change in the structure of property and liabilities of an economic entity, which is necessarily reflected in the information in the financial statements. Agricultural enterprises are active users of credit resources, which follows from the features of the production cycle (a large time gap from the start of the production cycle to the receipt of finished products). To comply with important principles of lending, such as payment, repayment and material security of the loan, the borrower should provide the lender with the necessary supporting documents to guarantee the ability to fulfill the terms of the loan agreement. The increase in accounts payable leads to a decrease in financial stability and the risk of loss of financial independence, the level of which can be determined by indicators of the capital structure in the financial statements. Financial statements (accounting) are the basis for the analysis and assessment of risks, as well as the development of an action plan to eliminate them or reduce the negative impact on financial results.

To solve such problems, it is rational to apply strategic analysis. Strategic analysis involves comparing the planned indicators and goals of the business entity with the actual state of things and the possibilities of achieving them in the current reality (under the influence of external circumstances), as well as analyzing and assessing the inconsistencies that contribute to effective risk management. The general strategic plan covers the entire set of business processes of the enterprise as a holistic structure, from which a specific area or problem can be distinguished [8, 37].

Carrying out a strategic analysis, agricultural organizations should prepare individual key performance indicators (KPI), which are quantitative indicators of the results of economic entity operations. KPIs allow judging the results of a particular unit in achieving common strategic and tactical goals. At the same time, the principle of rationality must be taken into account, since the development of our own system of indicators is labor-intensive measure, which can be expensive and not practical for small enterprises. There are two types of key indicators:

- demonstrate the result after the reporting period;
show process management capabilities during the reporting period. Both of these allow identifying and assessing the impact of risks on the activities of an economic entity. The first ones - to create measures and reserves to prevent a high level of risk in a strategic perspective, the second ones - to minimize the negative effects of ongoing risk management. Both groups of indicators are formed on the basis of accounting and managerial accounting data, as the main system for collecting, registering and processing information on business transactions.

The following indicators can be specific KPIs for agriculture: average daily weight gain of poultry; feed consumption per kilogram gain; productivity from 1 hectare; the number and timing of delays in shipment of finished products, etc. All these performance indicators of current assets will allow assessing the productivity of each unit, identifying the “problem areas” and areas of risk situations. This is necessary to ensure the balance of the entire production process.

In general, it is advisable to use this type of analysis, since the development of our own system of indicators is a labor-intensive measure, which can be expensive and not practical for small enterprises.

Also, when analyzing the accounting information of agricultural organizations, it is necessary to control liquidity risks in order to take timely measures to reduce them. Figure 2 presents the liquidity risks in accordance with the balance sheet items.

![Figure 2. Liquidity risk classification.](image)

In addition to the risks of a decrease in liquidity in agricultural organizations, there are risks of a decrease in profitability, turnover, an increase in the resource intensity of production, the risk of losses due to violations of the storage conditions of excess inventories and finished products, and others. For example, these features of agricultural production necessitate an analysis of not only the efficiency of use of current assets, but also their security. It is possible to identify the level of risk by analyzing the information of financial and management accounting.

It is important to establish a certain sequence of actions of the accounting and analytical service of the enterprise in response to events leading to situations of risk and uncertainty. A comparison of the stages of these processes allows highlighting the similarity of the order of work with risk.

4. Discussion
For risk management purposes, in accordance with the specification of established standards, certain risk management rules exist. They include the necessary activities, stages and sequence of actions, the circle of responsible persons for their implementation, the areas of responsibility of these persons, a set
of reporting forms, and other mandatory points [9]. However, in standardized risk management models, there are no rules for building an accounting and analytical risk system [10]. It can be concluded that the reflection of risks in accounting is not carried out according to the recommended risk management scheme from risk management standards. It is carried out in accordance with the rules of accounting and reporting adopted by the organization. There is a possibility of separate accounting of risks from the risk management system.

Accounting can increase the reliability of the entire risk management system, since it is accounting and management reporting that act as the information base of the risk management system. Having objective information detailed in accordance with the needs of the user, will allow managing not only individual business processes of the organization, but also making management decisions at micro and macro levels. The existence of additional arbitrary reporting forms containing explanatory materials that are not included in the main statements, but which are important for assessing the state of the organization, is also possible. A feature of such documents is the subjectivity of the data contained in them due to the lack of well-established regulatory requirements for the presentation of information.

Risk management standards provide for the risk mapping, which is a documentary evidence of the presence of risks. Mapping allows making an initial risk assessment with the definition of its preliminary characteristics (probability of occurrence, danger and its degree, etc.) and visual presentation of information. Risk maps are a flexible analytical tool that can be formed at the level of the company as a whole, or of its individual divisions, areas of business or individual projects. Such documents can be considered the method of initial registration.

Control and monitoring are important stages of management (Figure 1), since they allow timely responding to changes in the value of risk, tracking the likelihood of losses and the consequences of risks, and also adjusting the work at other stages. The absence of a separate stage “risk accounting” in the standardized risk management systems does not mean its absence. Without consideration, it is impossible to effectively control the development of situations of uncertainty and risk. Risk maps can be considered indirect evidence of the interconnection of risk management standards and accounting of the organization.

Risk management standards do not provide for the subsequent implementation of accounting procedures for registering risk maps as primary documents in the organization's accounting system. But some models recommend a sequential generalization of the results for each risk map for a separate business entity for the purpose of further analysis and conclusions (“Risk management of organizations. Integrated model”, “Risk management - principles and guidelines” [11]).

The set of risks to which the economic activity of an enterprise and its financial stability are exposed constantly affects the enterprise itself and its environment. To systematize many different risks, there is a system for classifying them according to various criteria. In accordance with this classification, by grouping and summarizing the information obtained on the basis of risk maps, a common document is formed that characterizes the picture of risks in general and on various aspects.

Risk management built in accordance with the standards of the integrated model provides an analysis of the objectives of the business entity. Global goals are contained in the statutory documents, and current goals are formulated on the basis of the analysis of financial documents and economic indicators. Risk management involves identifying external and internal factors and events that can affect goals. It is worth noting that such an influence of uncertain events can lead to unattainable goals, but also contribute to their implementation. In particular, the standards of the integrated risk management model developed by the Committee of Sponsoring Organizations of the Treadway Commission have expanded and explain in detail the algorithms of taxonomy of events [11]. Events become the cause of situations of uncertainty and risks of an economic entity. They determine the nature of the risks and the primary classification features (time and place of occurrence, source, level of financial losses, duration of exposure, causes of occurrence, etc.).

Existing systems for grouping risks by classification criteria do not provide information on the following points: the existence of methods for predicting this risk; performing a qualitative or quantitative analysis; monetary risk assessment; availability of reflection in accounting, etc.
It must be emphasized that the maintenance of financial accounting presupposes its compliance with accepted national (international) standards, which have strict rules and procedures, therefore they contain data on the limited number of risks of the organization. Financial accounting information is generated primarily for the purpose of reporting to external interested users and thus reflect a limited set of risks. The level of development of financial institutions and structures in various countries determines the accounting system of enterprises and the informational orientation of the generated reporting. For example, the US has a well-developed securities market, and many companies are interested in attracting private investors. Therefore, the accounting system is aimed at providing potential investors with the necessary data on the activities of the enterprise. In Germany, financial statements are focused on providing data to banking institutions, since historically their role in lending to organizations is great. In Sweden and Russia, financial statements are intended to provide information to government agencies.

For internal users performing risk management of the organization, one should use the statements generated in the framework of business management accounting. Management accounting due to more flexible approaches and rules is able to record a wider range of risks. An important criterion for accounting for risks is the ability to measure them in monetary units.

Some economic risks, not being accounting ones, are subject to accounting (Figure 3). The assessment of these risks for accounting purposes is carried out by the organization independently, based on the requirements of standards (RAS and IFRS).

| Event                                      | Risk                                              | Assessment method for accounting | Reflection in accounting | Note                                                                 |
|--------------------------------------------|--------------------------------------------------|----------------------------------|--------------------------|----------------------------------------------------------------------|
| Impairment of inventories                  | Risk of losses in case of non-reimbursement of inventory costs | Difference between market and accounting value | Account 91 "Other income and expenses" |                                                                  |
| Impairment of non-current assets (fixed assets) | Risk of losses in case of non-reimbursement of costs for fixed assets | Difference between market and accounting value | Account 91 "Other income and expenses" |                                                                  |
| Impairment of financial investments        | Risk of losses in case of non-reimbursement of costs for financial investments | Difference between estimated and accounting value | Account 91 "Other income and expenses" |                                                                  |
| Estimated liabilities                      | Risk of losses from payment of imminent liabilities | Present value of contingent liabilities | Account 91 "Other income and expenses" | Explanation note to the financial statements |
| Contingent liabilities                     | Risk of losses from the payment of contingent liabilities | Probable value of liabilities (range of values) | Account 91 "Other income and expenses" |                                                                  |
| Provision for bad debts                    | Risk of non-repayment of receivables              | Estimated non-refundable amount based on probability estimate | Account 91 "Other income and expenses" |                                                                  |

Figure 3. Economic risks accepted for accounting.
Let's pay attention to estimated liabilities. Most of the estimated liabilities comprise the special conditions of production activity. Scientists I.E. Mizikovsky and E.P. Polikarpova believe that the facts of economic life, by which the estimated liability should be recognized, are different in their content, the order of occurrence, distribution, as well as the frequency and probability of occurrence in the organization's activities [12, 36]. It should be noted that among the estimated liabilities generally accepted for organizations of all sectors of the economy, special types are characteristic of agricultural enterprises.

A case in point is the example of labor costs for employees. When analyzing the dynamics of the magnitude of labor costs, one should take into account amounts that are not directly related to the production process and do not depend on the volume of production. Such amounts include payments on annual leave of employees, as well as compensation for unused leave upon dismissal. As a rule, the peak of vacations by an employee of various enterprises falls on the summer months. Therefore, in accounting, writing off large amounts of vacation pay to production costs will lead to an increase in the amount of expenses not related to the results of current production activities in the current month. Data comparability is ensured in the following ways: inclusion of the amount of payments in the planned indicators of monthly expenses calculated on the basis of vacation schedules; exclusion of payment amounts from the actual cost of labor.

In agricultural organizations of the plant growing industry, due to the seasonality of the production process and the significant intensity of work in certain months of the calendar year, the summer season does not become the dominant period for annual vacations. Natural phenomena that are not manageable and have a significant impact on the results of agricultural production (productivity, terms, volumes of finished products, etc.) create their own rhythm of amount and intensity of work, making significant adjustments to plans and forecasts. Spent labor resources and the funds accrued for their payment are directly dependent on them. The vacation period in the organization will be shifted mainly to the time of less stressful work, so the formation of estimated liabilities takes place in a special order.

Risk assessment is the process of identifying and analyzing risks, i.e. a combination of the probability and consequences of the economic entity not achieving the goals of its activities. When identifying such risks, the economic entity must make appropriate decisions to manage these risks. Risk management is possible by creating the necessary control environment, selecting and organizing individual internal control procedures, by choosing methods and methods for assessing the results of internal control, as well as informing personnel [13, 5].

Analysis of accounting and analytical data should be carried out both separately for each group of assets and liabilities, and throughout the category as a whole, making generalized conclusions and assessing the current state, as well as in the aggregate of all areas of the enterprise. This will allow for the development of possible development scenarios in the future, taking into account the forecasts and goals of strategic planning. This approach provides an opportunity to assess the impact of risks in the future, which is especially important for agricultural enterprises with their long production cycle. Conclusions about the achievement of the goals are based on the analysis of deviations and inconsistencies of planned and actual indicators. In practice, it is advisable to apply methods of comparing the relative and absolute indicators of the actual results of the current period with the planned, as well as with the actual indicators of previous periods (study of history).

5. Conclusions
In the process of risk management, information on risks obtained from financial, managerial, and tax accounting is used. Each of them has its own goals and objectives, based on distinctive accounting principles, applies specific methods for assessing objects, and other features. There is a possibility of accounting for the same risks in different accounting systems. For example, in accounting, estimated liabilities are accounted for at the last accounting date and measured at the current liabilities. In tax accounting, estimated liabilities are accounted for during tax reporting periods in terms of estimated expenses. The basis for this is the information on past periods. A different assessment of the same risks
is not entirely constructive. The risk manager may have difficulty in choosing options for information sources directly in the organization's risk management process.

Thus, risk management has the main goal - to identify and minimize possible damage to the property and capital of the agricultural organization due to the implementation of adverse events in the face of uncertainty of the external and internal environment. The implementation of this in practice must be carried out in close conjunction with the accounting and analytical system to integrate data and simplify control. Control and management are becoming the most productive in the cooperation with accounting. Application to the organization’s reporting methods of analysis, which allow assuming the development of situations with various outcomes of events, will create an opportunity to assess the financial situation of the organization in various ways.

Nowadays, the risk management process is one of the most dynamically developing management techniques. The greatest distribution and development of risk management techniques were in the banking and financial sectors of the economy. But the application of risk management approaches is a prerequisite for ensuring the sustainable development of organizations, regardless of its field of activity. It is especially important for agricultural organizations to ensure stable functioning in conditions of risk and environmental uncertainty, taking into account the industry-specific features of production processes, since they are the guarantors of the food security of our country.

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