

ACCOUNTING AND ANALYTICAL METHODS FOR IDENTIFYING RISKS OF AGRICULTURAL ENTERPRISES' SUSTAINABLE DEVELOPMENT

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Abstract. The comprehensive methodology for identifying the risks of agricultural enterprises' sustainable development is proposed in the article, and it is based on the calculation of absolute and relative indicators of the capital value change under the influence of identified accounting, economic and eco-social risks. The novelty of this methodology is the combination of risk identification techniques within the framework of the specifics of achieving sustainable development by agricultural enterprises. In the mainstream of the research, the authors disclosed the main shortcomings of accounting practices affecting the change in the size of the enterprises' capital. The practical significance of author's research lies in their possible use by agricultural enterprises in identifying factors affecting the profitability of anti-risk measures to improve sustainable development.

Keywords: accounting and analytical support, sustainable development, agriculture, risk.

1 Introduction

There are many models for diagnosing the risks impact on the financial and economic enterprise state using various indicators calculated on the basis of accounting reports. At the same time, when analyzing the agricultural enterprises' financial condition, such models do not take into account the specific features of sectoral regional specificities and, first of all, the principles of sustainable development, which in normative documents are absent altogether. Given this, based on such an analysis, it is difficult to make an unambiguous conclusion about the agro-industrial enterprises' sustainable development in terms of organizational and technical specifics, goals and strategies, coverage of the market segment, phases of the life cycle, etc. It is necessary to use a complex of different models with the optimal number of coefficients, taking

into account the specific nature of the AIC to prevent questionable results of analysis of the impact of risks on sustainable development.

2 Methods and Results

2.1 Analysis of common methods for assessing the sustainable development risks

Variety works of investigation the essences, classifications and methods for determining entrepreneurial risk have been conducted by many scientists, in particular: E.I. Altman (1968) [1], Aman, & Rahman (2011) [2], I.A. Blank (2005) [4], Gul et al. (2013) [4], T.G. Kaminska (2014) [5], Khan & Bhatti (2008) [6], Khurana & Raman (2004), [7], Manfred & Kellezi (2006) [8], O.V. Smetanko (2014) [9], R. Toffler, H. Tishaw (1977) [10] and other.

The part of the researches is devoted to determining the risk in the audit and the quality of the audit services provision, which can significantly affect on the investors decision, creditors, counterparties, etc. (Gul et al., 2013; Khurana & Raman, 2004) [4, 7]. However, in today's economic realities, there is a need to determine the risk in accounting, since it is the quality of financial reporting data that leads to stakeholders' global decisions (Nichita, 2015, Nichita & Turlea, 2015, Sunder, 2015, Schiff et al., 2012) [11-14]. At the same time, the impact of risks on decisions made on the basis of accounting and analytical support for the management of agricultural enterprises' sustainable development, almost unexplored.

Analysis of accounting and analytical risks for the indicators formation of assessing the agricultural enterprises' sustainable development should be conducted in several stages: the diagnosis of the probable bankruptcy risk, the assessment of the consequences of risks and the analysis of the cost effectiveness of anti-risk measures in accounting. On the one hand, the above steps should cover the assessment of risks of an economic, ecological and social nature, and on the other – not to be time-consuming and costly. In addition, the process of analyzing the risks of sustainable development for agricultural enterprises should be based on the following principles: accuracy, measurability and other principles of international accounting and financial reporting.

Accounting and analytical model as a basis for the formation of agricultural enterprises' sustainable development reporting depends on the choice of the assessment base and the concept of capital preservation (financial or physical). According to the financial concept of capital: invested funds or the invested purchasing power and the capital are synonymous with the net assets or the equity of the enterprise. According to the physical concept of capital: production capacity and capital are considered as the productivity of an enterprise, based, for example, on the units produced per day [15]. The advantage of the financial concept model, which reflects changes in capital in financial (monetary) indicators, is the understandability of indicators and the avail-

ability of an analysis procedure for managers and stakeholders of agricultural enterprises.

We can use the methods generally accepted in economic analysis to analyze the financial and economic situation, the risk of losses and the likelihood of bankruptcy:

1. Analysis of the break-even sales aims to find out the non-profit turnover and financial strength margin in the form of the difference between the actual and the threshold sales volume. The method involves calculating the critical level of fixed and variable costs and the marginal price per unit of output. The level of these indicators can be determined graphically or analytically.

2. Analysis of financial ratios provides for the definition of liquidity, financial stability and profitability in order to identify the organization's possibilities for debt recovery, the ratio of own and borrowed capital, the efficiency of using its own working capital, in particular, resources of the enterprise. The quantitative and qualitative filling of the given block of analysis should be carried out taking into account the specific features of the activity of the analyzed enterprise.

The first method covers also an estimation of bankruptcy probability of the enterprise mainly within of discriminant factor models. In international practice, Altman's multi-factorial models are widely used to predict bankruptcy, which makes it possible to forecast bankruptcy for a five-year period with an accuracy of up to 70% [16, p. 481].

The first multidimensional model of forecasting bankruptcy was developed by E. Altman (1968) [1] from New York University in the late 1960s. After this pioneering work, a multidimensional approach to forecasting bankruptcy spread throughout the world among researchers in finance, accounting, banking and credit risk.

It is important to note, that none of the existing models for predicting the bankruptcy probability cannot give an absolutely accurate result, because it is based on the results of a survey of sample data received at enterprises in a certain period of time and certain industries. Therefore, when choosing a model, it is necessary to take into account the specifics of the enterprise's activities, in particular the agrarian sector with shifting production cycles, seasonality, cyclicity, etc.

2.2 The methodology for risks identifying of agricultural enterprises' sustainable development

The analysis of the risks consequences in accounting for sustainable development contains methods and techniques that allow to identify the impact of each type (or each group) of risks on the performance of the organization and, above all, on capital. The following system of absolute indicators can be used to analyze the consequences of the risks impact on the agricultural enterprise capital, (Table 1).

Table 1. Absolute indicators of the change in the capital value under the influence of identified risks.

Type of risks, which are reflected in the	The economic essence of the indicator	The risk effect characteristics of sustainable development
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Sustainability Accounting		
The risks of changes in the value of assets inherent in agriculture	The risk characterizes the change in the size of capital in view of changes in the value of assets under the influence of environmental factors	The amount of exchange rate differences, changes in the reserve of doubtful debts, provisions for impairment of financial investments, current market value of financial investments, tangible assets, fixed assets, intangible assets
Risks of insufficiency created reserves to cover costs	Characterizes a change in the size of capital due to the insufficiency (excessive) of the reserves of future expenses	The difference between the amount of reserves created by future and actual costs, including the cost of unsecured reserves
The risks of property loss	Characterizes a change in the size of capital due to losses, shortage, theft of property	The value of the property losses detected and registered in the accounts
Commercial risks	Characterizes the change in the size of capital due to losses in the process of selling products, goods, works, services	Amount of losses from the loss and damage of goods in warehouses, during transportation, losses from substitution of poor quality goods, fines, penalties and penalties for violation of the terms of economic contracts and other arising in the process of selling goods and services
Production risks	Characterizes a change in the value of capital as a result of deviations from the normal production process	The amount of losses from lack of production, as well as deviations in the cost of finished products
Emergency risks	Characterizes a change in the size of capital under the influence of the effects of emergencies	Difference between loss from emergency and extraordinary income
Environmental and social risks	Characterizes a change in the size of capital in connection with causing damage to the environment	Amount of compensation for damage caused to the environment
Accounting (information) risks	Characterizes the change in the size of capital under the influence of risks due to the peculiarities of accounting organization	Cost of consequences of risks from changes in accounting policies and risks of distortion of information disclosed in accounting

Financial risks that are reflected in accounting can be classified as risks associated with changes in the assets value and risks associated with the implementation of future expenses. The consequences of risks associated with changes in the inventories value, receivables and financial investments are reflected in the accounting records by creating valuation reserves in the event of a decrease in the value (impairment) of the asset, provided that the created reserve increases the amount of other expenses. However, in the future the amount of the created reserve can be restored, which increases the amount of other firm revenues. Despite the fact that the change in the value of an individual object under of such risk influence can not be favorable, the impact of the risk effects on the amount of capital in different reporting periods can be positive or negative. This is due to the fact that in any periods, the amount of created reserves may exceed the recovered amounts.

The change in the fixed assets value and intangible assets is reflected in the accounting through revaluation. And this results affect to the additional paid-in capital and retained earnings. The result of revaluation can be both an increase and a decrease in the value of fixed assets and intangible assets, and, accordingly, the cost of agricultural enterprise's capital.

The currency risk impact is reflected in the bookkeeping records as currency difference arising as a result of currency exchange fluctuations at the value of monetary assets and liabilities in foreign currency. Positive currency difference lead to an increase in financial income, negative – an increase in financial expenses, except for exchange differences when making contributions to the registered capital in foreign currency, causing changes in additional paid-in capital.

Also, in order to analyze the impact of the risks consequences in accounting and analytical support on the capital amount, it is expedient to calculate the relative indicators (Table 2).

Table 2. Relative indicators of changes in the value of capital under the identified risks influence

The indicator name	The economic essence of indicator	Method of calculation
The relative change in the capital amount due to the influence of the i-th type of risk in accounting	Characterizes the relative change in the amount of capital under the influence of the i-th type of risk consequences in accounting	It is determined by the ratio of the change in the capital amount under the influence of the consequences of the i-th type of risk in accounting to the amount of capital
The relative change in the amount of capital due to the impact of all types of risks in accounting	Characterizes the relative change in the size of capital due to the impact of the effects of all types of accounting risks	It is determined by the ratio of the change in the amount of capital under the influence of the consequences of all risks in accounting to the amount of capital
The share of the	Characterizes the share of	It is determined by the ratio of the

change in the amount of capital under the influence of the consequences of the i-th type of risk in accounting in the general change in the amount of capital	change in the amount of capital under the influence of the consequences of the i-th type of risk in accounting in the general change in the amount of capital	change in the amount of capital under the influence of the consequences of the i-th type of risk in accounting in the overall change in the amount of capital for the reporting period
The share of change in the amount of capital under the influence of the consequences of all risks in accounting in the overall change in capital	Characterizes the share of capital change under the influence of the consequences of all risks in accounting in the overall change in the amount of capital	It is determined by the ratio of changes in capital under the influence of the consequences of all types of risks in accounting in the overall change in the amount of capital for the reporting period
The share of the change in the amount of capital under the influence of the consequences of the i-th kind, the risk in accounting in the change in the amount of capital under the influence of all risks in accounting	Characterizes the share of change in the amount of capital under the influence of the consequences of the i-th type of risk in accounting in the change in the amount of capital under the influence of all risks in accounting	It is determined by the ratio of the change in the amount of capital under the influence of the consequences of the i-th kind of risk in the accounting of changes in the amount of capital under the influence of the consequences of all risks in accounting

In order to analyze the effectiveness of costs for anti-risk measures in accounting, it is necessary to determine the result from the implementation of certain activities, namely the difference between the income from the activities carried out and the costs for them. Absolute indicators of the analysis from the use of anti-risk instruments are given in Table 3.

Table 3. Absolute indicators of the analysis from the use of anti-risk instruments

Type of anti-crisis measures	The economic essence of indicator	Influence characteristic aimed at reducing the capital risk
Insurance	Characterizes the change in the capital amount in connection with the insurance implementation	Defined as the difference between the amount of income received (insurance compensation) and the amount of insurance costs incurred

Conducting internal and / or external environmental audits	Characterizes the change in the amount of capital in connection with the conduct of internal or external audit	It is defined as the difference between the income from the creation of the internal audit service or, the involvement of external auditors and the costs of creating an internal audit service or the involvement of external auditors
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One of the most effective tools for minimizing risks in agriculture is insurance, which allows to transfer the risk of an insurance company for a certain fee, in the event of an insured event, will reimburse the costs of the insured.

In addition, in order to reduce accounting (information) risks, the agricultural enterprise may decide to establish an internal audit service or attract external auditors, which is conditioned by the desire to form and, accordingly, provide better information to users-stakeholders and prevent eco-social imbalances in both middle of the enterprise, and beyond. Under such conditions, the effectiveness of such measures is confirmed by a reduction in errors in accounting, which can lead to a reduction in fines and penalties for violation of legislation, including eco-social. The impact of the such consequences actions on the capital amount can be calculated as the difference between the income from the activities carried out (reduction of penalties for violation of the law) and the corresponding costs.

In addition to the above absolute indicators, we can calculate the relative indicators of the analysis of the effectiveness of anti-risk measures which presented in Table 4.

Table 4. Relative performance analysis of the anti-crisis measures

The indicator name	The economic essence of indicator	Method of calculation
Coefficient of costs return for anti-risk measures	Characterizes the degree of reimbursement of expenses for all anti-risk events	Defined as the ratio of the amount of revenue from the implementation of all anti-risk measures to the amount of costs for the implementation of all anti-risk measures
Reimbursement ratio for i-th type of anti-risk measures	Characterizes the degree of reimbursement of expenses for the implementation of the i-th type of anti-risk measures	Defined as the ratio of the amount of income from the implementation of the i-th type of anti-risk measures to the amount of costs for the implementation of the i-th kind of anti-risk measures
Profitability of costs for anti-risk measures	Characterizing the profitability of all anti-risk measures	Defined as the ratio of the effect of the introduction of all anti-risk measures to the amount of costs for the implementation of all anti-risk measures
Profitability of	Characterizing the profit-	It is defined as the ratio of the

expenses for the implementation of the i-th kind of anti-risk measures	ability of the i-th kind of anti-risk measures	effect from the implementation of the i-th kind of anti-risk measures to the amount of costs for the implementation of the i-th kind of anti-risk measures
The share of the change in the amount of capital from the effective implementation of anti-risk measures	Characterizes the relative change in the amount of capital under the influence of the effect of the introduction of anti-risk measures in the overall change in capital	It is determined by the ratio of the total effect from the introduction of all anti-risk measures to the total change in the amount of capital

Among such indicators, we can calculate the cost recovery factor for anti-risk measures by types of activities and profitability of expenses for the implementation of anti-risk measures as well as by types of activities. The coefficient of cost recovery for the anti-risk measures is calculated as the ratio of income from the application of anti-risk measures to the cost of carrying out anti-risk measures. The event can be recognized as successful when the cost recovery ratio for it should be at least equal the one, that is, the revenue from the implementation of the event should, at a minimum, cover the costs for it. The profitability of expenses for the implementation of anti-risk measures can be calculated as the ratio of the effect from the introduction of anti-risk measures (the difference between the revenues from the event and the costs of it) to the costs for it. The value of the coefficient shows how many cents of profit from the carrying out of the anti-risk measure are accounted by the dollars costs for its conduct. Such indicators can be defined as for each type of conducted anti-risk measures, and for all measures in general.

3 Conclusions

A reliable system of management control or external eco-social audit becomes actualized in view of the lack of agricultural enterprises' desire to use insurance tools as a method of preventing risk and reducing their impact on accounting and analytical support for sustainable development.

So, the relative change in the capital amount due to the influence of the i-th risk type in accounting depends on the following indicators effect:

- share of the change in the capital amount under the influence of the consequences of the i-th kind of risk in accounting in the capital amount change under the influence of risks in accounting;
- share of the change in the capital amount under the influence of the risks effects in accounting in the total capital amount change;
- the growth rate of capital for the period.

Thus, the profitability of costs for implementing anti-risk measures is determined by the following factors:

- shares of the capital amount change under the effect influence of the introduction of anti-risk measures in the overall change in capital;
- growth rate of capital for the period
- coefficient of capital consolidation
- the cost of carrying out anti-risk measures per dollar of proceeds from sales.

The article novelty is the analysis combination of standard economic risks and risks of the eco-social direction, taking into account accounting risks. At the same time, the size of the capital of an agricultural enterprise depends on:

- the activity specifics;
- eco-social factors that cause the main risks of sustainable development;
- tax risks;
- risks of land relations.

The practical essence of author's research is the possible use of this method of risk identification by agricultural enterprises in identifying factors affecting the profitability of expenditures under the anti-risk measures to improve sustainable development.

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