

PAPER • OPEN ACCESS

Methodological foundations of the reference normalized model of an agricultural holding financial stability

To cite this article: Z E Shapороva and A V Tsvettsykh 2019 *IOP Conf. Ser.: Earth Environ. Sci.* **315** 022069

View the [article online](#) for updates and enhancements.

You may also like

- [Economic potential of the agro-industrial complex of the provincial region](#)
O S Grozova, V Y Maslikhina and G S Tsvetkova
- [Formation of a system for increasing the sustainability and productivity of the agro-industrial complex](#)
L A Kharitonov, E V Kucheryavaya, J I Zhemerikina et al.
- [Strategic priorities for developing the agro-industrial complex and rural areas of the region](#)
V G Zakshevsky, O G Charykova and I N Merenkova



ECS
The
Electrochemical
Society
Advancing solid state &
electrochemical science & technology

DISCOVER
how sustainability
intersects with
electrochemistry & solid
state science research

Methodological foundations of the reference normalized model of an agricultural holding financial stability

Z E Shaporova and A V Tsvettsykh

Institute of Economics and management of agro-industrial complex, Krasnoyarsk State Agrarian University, 117 Lenin st., 660049 Krasnoyarsk, Russia

E-mail: tsvettsykhalex@mail.ru

Abstract. Agro-industrial complex is one of the most important sectors of the economy, which solves the problem of food security enhancing in Russia. The processes of holding formation in the agro-industrial complex are important for the concentration of capital and attracting investment in the realization of projects, increasing the export potential of agro-industrial enterprises. Creation and sustainable development of an agricultural holding requires the use of special corporate governance tools to improve the efficiency of planning and controlling financial flows of business units. In the article the principles of planning and controlling financial and economic processes of an agricultural holding are defined, the analysis of creation methods of the reference normalized model is carried out. As a result of the research, the authors proposed methodological foundations for the formation of the reference normalized model of financial stability of an agricultural holding.

1. Introduction

Agro-industrial complex (AIC) has key importance for sustainable socio-economic development of Russia and its regions [1-2]. The authors understand the reference normalized model of financial stability of an agricultural holding as the fixed target proportions between reference values from components of increasing value of own funds (ΔOF) in an agricultural holding and reference value from a stock of financial stability (ΔSFS) in an agricultural holding. The value of the financial stability reserve is defined as the difference between the total amount of equity and the size of the fixed capital of the agricultural holding. The nature of the financial stability of the agricultural holding is the formation and effective maintenance of financial synergy [3-6].

2. Methodological principles of planning and controlling financial and economic processes of an agricultural holding, as a methodological foundation for the formation of the reference normalized model

Taking into account the status of the agro-industrial complex and the forecast of its development it is possible to identify the main trends and regularities of change in the status of the agro-industrial complex. We reveal the essence of some selected regularities in development of the agro-industrial complex. The regularity of negentropy nature in the development of the system as a result of increasing the imbalance of economic processes is a connection expression of sustainable development in the agro-industrial complex with its ability to attract and effectively use energy and resources from the environment in the form of new knowledge, investment to overcome the devastating impact of



economic imbalances. Table 1 presents a list of the most significant principles of planning and controlling financial and economic processes of an agricultural holding in accordance with the selected regularities of AIC development.

Table 1. Principles of planning and controlling financial and economic processes of an agricultural holding.

Regularities of sustainable development of agro-industrial complex	The structure principles of planning and control levels of decision-making			
	Corporate level		Business unit level	
Negentropy nature of the system development as a result of increasing imbalance of economic processes	Adaptability, flexibility, optimality	interactivity, continuity,	Accuracy, alternative, adaptability	relevance, continuity,
Increasing alternatives of "economic combinations" as a result of innovative activity and socio-economic development of the company	Alternative, adaptability,	flexibility, optimality	Accuracy, decomposability,	relevance, flexibility
Reduction of the life cycle duration of the process of origin and useful implementation of innovations	Adaptability, criteria, optimality	flexibility,	Criteria, adaptability	accuracy,
The growing value of sustainability and risk reduction under the influence from increasing uncertainty of the innovation richness	Adaptability, criteria, optimality	flexibility,	Criteria, accuracy	relevance,

3. Analysis of modern methodological approaches to the formation of the reference normalized model of financial stability of an agricultural holding

In formation of the reference normalized model of financial stability of an agricultural holding several methodological approaches can be considered that have received practical application in the scientific literature. Based on the accounting nature of financial stability in an agricultural holding, the requirements of the set of selected principles of planning and controlling financial and economic processes, we consider several such methodological approaches.

3.1 Model with an ideal point

Using a model with an ideal point is based on comparing studied object status with a given reference by establishing a difference. In accordance with this model, the status of the object is normalized by establishing for each sign of its status a certain distance from the ideal or reference value of the sign. At the first stage of the model formation the vision of the ideal (reference) status of the studied object feature is formed and, accordingly, the "ideal" point is introduced for each feature X_0 .

The model allows us to assess the degree of proximity of studied object status to the "ideal" status in accordance with the expression (1):

$$W_0 = \sum_{i=1}^n K_i |X_i - X_{0i}|^m, \quad (1)$$

where, K_i is weight coefficients of the considered signs of the studied object status; X_{0i} is coordinates of the ideal point of the sign of studied object status.

The exponent m is given by the researcher and usually takes values at level 1 or 2. Synthesis is carried out by n signs of the studied object status. Minimum values W are preferred. Since, if the ideal point of the sign of the studied object status is the best, it is necessary to have a minimum distance from this point.

To use a model with an ideal point, the values of all the coordinates of the economic characteristics of the studied object status must have the property of additivity, so that the researcher can sum up all

the values in the formula. A valid solution in this case will be the use of point estimates. Another way, which has become widespread in modern practice, is to normalize the considered signs of the studied object status. In this case, the actual levels are divided into reference (normative), representing the coordinates of the ideal point.

3.2 Model with normalized feature levels

The use of models with relative features allows combining the characteristics of the studied object status with non-uniform dimension in one model. In this case, the normalized model is formalized according to the expression (2):

$$Y_0 = \sum_{i=1}^n K_i (X_i / X_{oi}) = \sum_{i=1}^n K_i Z_i, \quad (2)$$

where, Z_i is parametric indexes; all signs of expression (2) correspond to the signs accepted in expression (1).

The presented model, in practice, has become widespread to assess the quality and competitiveness of products. When calculating quality indices X_{oi} – normative values established by standards and specifications levels of the property expression of the goods. Basically, the model (2) is used in the system analysis of objective (production and operational) properties of the goods, including: operating costs, performance, weight, reliability, etc.

In assessing the financial stability of an agricultural holding X_{oi} is the parameters of the compared status, which can be correlated with the best examples (standards), or set by the decision of the government.

3.3 Reference universal normalized model of profitability (loss) of output.

This model is an analytical (graphical) task of matching functions of mutual relations between the main economic parameters of the goods, in compliance with which the target level (standard) of profitability or unprofitability of goods production is achieved.

A widespread model related to the reference normalized models is the reference model of the correspondence of ratios of conditionally constant and variable costs and the relative price of the goods, upon reaching which the reference level of profitability (loss) in shares (or percent) to the cost price (profitability of products) is provided. We consider the general results of methodological approaches to the formation of the reference normalized model, which can be used to plan and control the balance, proportionality and efficiency of financial and economic processes of an agricultural holding. To do this, we highlight the advantages and disadvantages of methodological approaches to the formation of the reference normalized model, the results are presented in table 2.

Table 2. Characteristics of methodological approaches to the formation of the reference normalized model.

Methodological approach	Advantages	Disadvantages
Model with an ideal point	The valuation (fixing) the boundaries of change features (spacing) features in absolute values (to the reference)	It does not allow determining the ideal point of the object status characterized by features with non-uniform dimension.
Model with normalized feature levels	Rationing (fixing) the boundaries of the change in the signs of studied object status by establishing relative values (relation to the standard)	It does not allow determining the ideal point studied object status on the basis of normalization of the ratio of the reference values of the signs of studied object status
Reference normalized model of profitability (loss) of output	Rationing using non-uniform features of studied object status	They are not used as the considered signs – signs (factors) of financial stability of corporation

Graphic illustration of the standards of the financial stability level in an agricultural holding is shown in the figure 1.

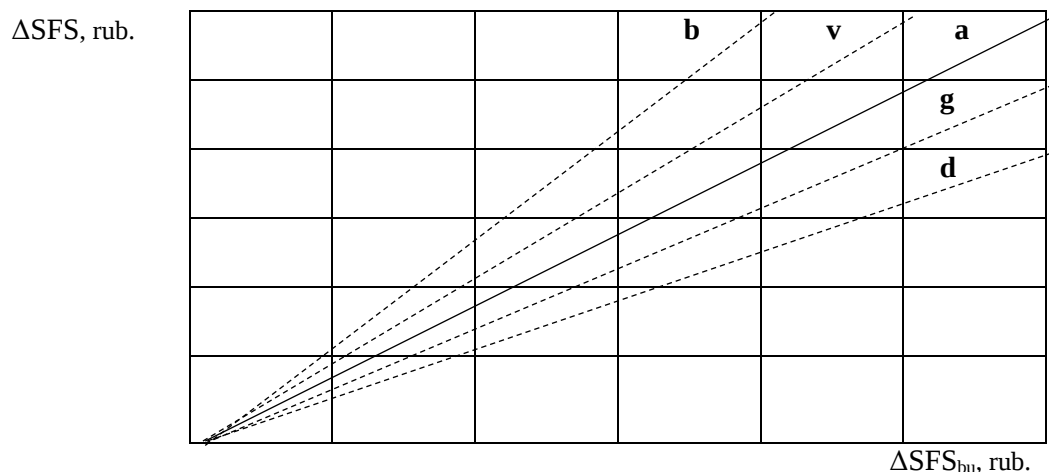


Figure 1. Graphic illustration of the standards of the financial stability level in an agricultural holding.

4. Conclusion

Dotted line (fig.) shows the ratio between the components of the increase in the value of own funds, the considered business unit of ΔOF (lines b, v, g, d), and the target (standard) value from a stock of financial stability (ΔSFS) is reflected. The solid line (line a) is an example of the reference ratio of the increase in the value of own funds and the target value of the stock of financial stability in an agricultural holding. A variety of such a model is a fixed target ratio (standard) between the total value of the components of the own funds growth in a business unit - ΔOF_{bu} and the normative value from a stock of financial stability of the business unit - ΔSFS_{bu} (in analytical or graphical form), which provides a fixed level (standard) of financial stability in an agricultural holding.

References

- [1] Latyshenko G I, Galchina D D and Gubanova M A 2017 On the role of strategic planning of small enterprises in an unstable economic situation *Management of social and economic systems* **2** 12-7
- [2] Erygin Yu V and Tsvetsykh A V 2009 *Strategic planning tools for innovative development of defense enterprises* (Krasnoyarsk: SibSAU) p 172
- [3] Kembell E and Sammerce L K 2014 *Strategic synergism* (SpB: Piter) p 416
- [4] Porter M E 1989 *Competitive Advantage* (Free Press New York) pp 318-319
- [5] Prahalad C K and Hamel G 1990 *The Core Competence of the Corporation* (Boston: Harvard Business Review) pp 79-91
- [6] Rumelt R P 1974 *Strategie Structure and Economic Performance* (Boston: Harvard Business School Press)