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RESEARCH ON THE SOURCES OF RISK FOR AGRICULTURAL COOPERATIVES IN NORTHEASTERN BULGARIA

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ABSTRACT
The paper explores the sources of risk for agricultural cooperatives, which reduce their competitiveness. A systematization of the types of risks for the agricultural cooperatives is carried out, focusing on two risk groups: risks originating in the environment (external risks) and risks within the organization (internal risks). On the basis of an empirical study of the sources of risk for agricultural cooperatives in the North-East region of Bulgaria, empirical models for the internal and external sources of risk are presented. The analyzes allow for generalizations to be made about the nature of the risks to agricultural cooperatives, allowing for effective risk management actions.

Key words: risk; sources of risk; agricultural cooperatives;

INTRODUCTION

In the highly competitive environment in which agricultural cooperatives operate in Bulgaria, effective risk management is crucial to their survival and market success. Risk identification is the first stage in risk management, along with analysis, evaluation, choice of coping mechanism and risk monitoring. Knowing the sources of risk is a necessary condition for systematic identification and successful risk management.
The aim of this paper is to present theoretically the sources of risk in agriculture, to propose a methodology for studying these constructions in order to identify and analyze the main barriers to the competitiveness of the cooperative organizations that carry out agricultural activities in the territory of the Northeast planning region in Bulgaria.

MATERIALS AND METHODS

In this paper we intend the term "risk" to mean an expected event that could affect the achievement of the organization's goals. The risk is measured by its effect and the likelihood of its occurrence (1). Sources of risk (2 - 5) are all factors in the environment of agricultural cooperatives - internal and external, which generate threats of loss or constraints related to the achievement of the organizations' goals.

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Depending on the sources of occurrence, internal and external risks can be identified, summarized in **Figure 1.**

Internal risks are conditioned by the business and management decisions taken within the organization itself. These are, for example, decisions related to the organization's assets, innovation activity, the level of specialization, the established work safety system, etc. These risks are managed relatively easily.

External risks derive from activities and decisions made by entities external to the organization and / or from environmental, climatic and ecological impacts. External risk sources can be divided into two large groups, namely risks arising from the external micro-environment and those resulting from changes in the organization's macro environment.

These two groups of risk differ in terms of the extent to which management decisions in the organization can affect the level of uncertainty. The first group of external risks derives from decisions taken by entities over which the organization has indirect influence, e.g. suppliers, customers, competitors, contact audiences. Normally, the level of these risks can affect the organization to varying degrees.

The second group of external risks, namely risks arising from the macro environment of the organization, are political, economic,

social, technological, environmental and natural. Generally speaking, the management decisions of individual farmers cannot influence the level of uncertainty arising from the external macroeconomic environment.

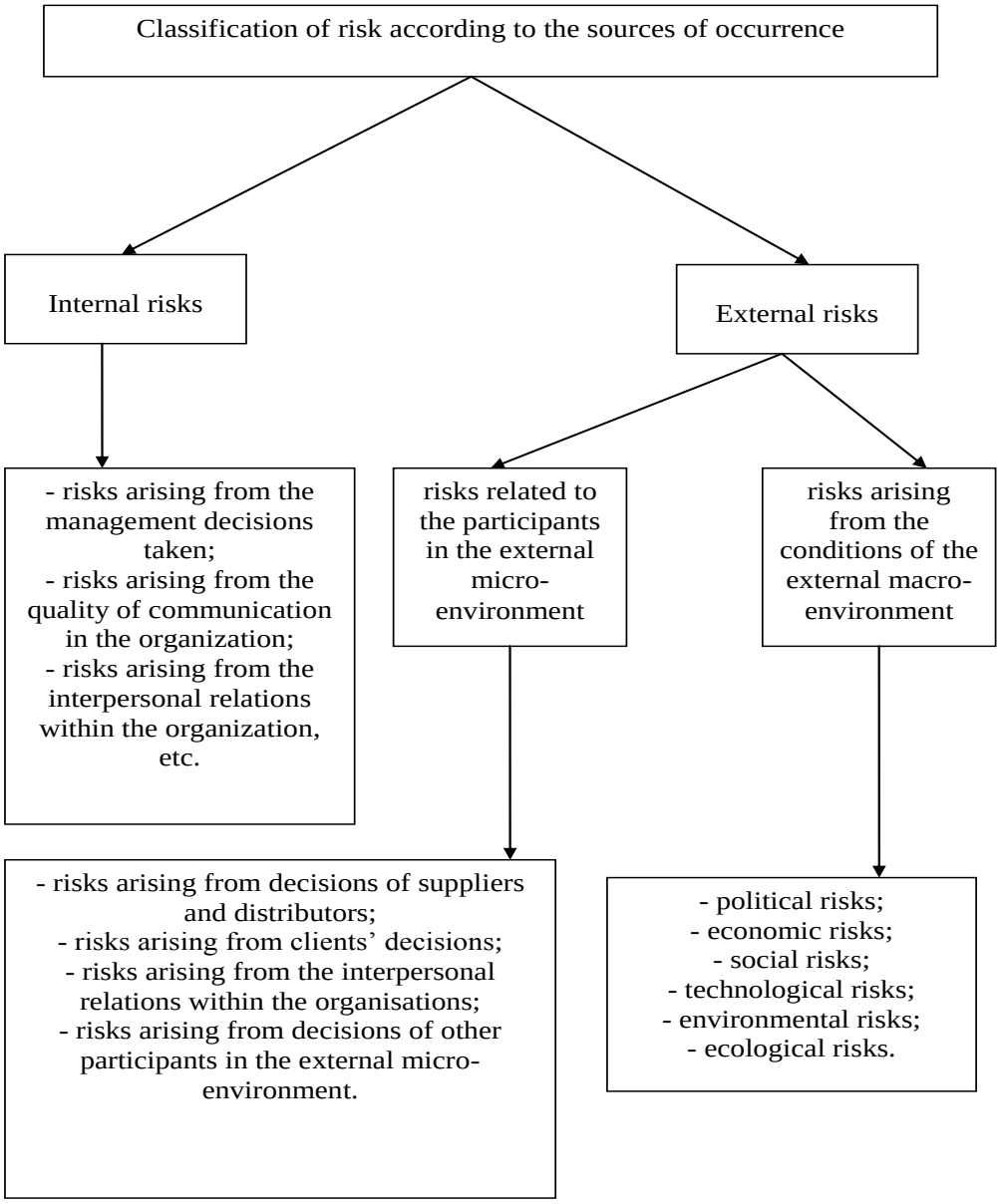

Figure 1. Types of risks according to the sources of occurrence

The emergence of risk in agriculture can have many dimensions. According to their source of origin, without doing a detailed study, a variety of risks can be distinguished, which affect the agricultural production to the greatest extent: production risk; market risk; financial risk; institutional risk; technological risk; personal risk.

Some typical internal and external sources of risk for agriculture are summarized in **Figure 2.**

The data in this article is based on a survey on the sources of risk to the agricultural cooperatives operating on the territory of the North-East Planning Region in Bulgaria. Management representatives of 42 cooperatives, located in the rural territories of the districts of Varna, Dobrich, Silistra and Shumen, were interviewed. The survey was conducted during the period January 17 - 20, 2017 within the framework of the annual qualification seminar with Chairs and Accountants of Agricultural Cooperatives from North-East Bulgaria, organized by the Cooperative Agricultural Union - Varna.

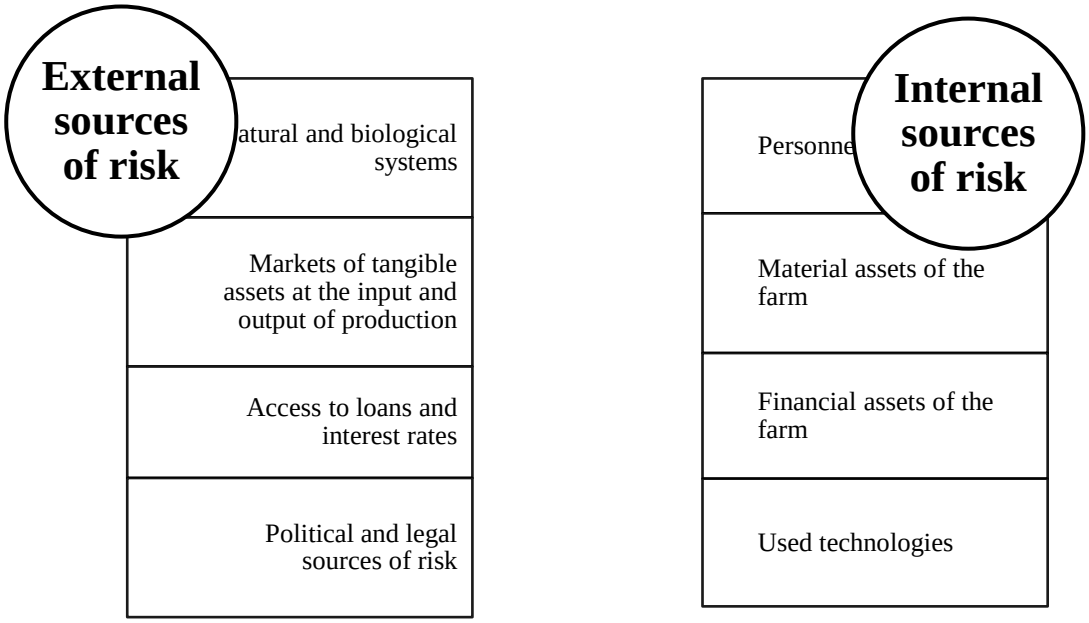

Figure 2. Typical internal and external sources of risk for agriculture

The purpose of the survey was to gather information on the types and sizes of risks arising from agricultural cooperatives and the strategies used to manage them.

The statistical processing of the information was accomplished using the SPSS 17.0 and MS Excel 2010 software.

In order to be able to research the risk profile of co-operatives, farmers were asked to answer questions about the frequency with which they face various adverse situations in their work. The frequency of occurrence of events is judged on an ordinal scale with the following meanings of the ranks: 5 - "often", 4 - "rather often", 3 - "not often or seldom", 2 - "rather rarely", 1- "rarely". The questionnaire provides an opportunity for respondents to indicate that they have never encountered the listed risk events in the last five years.

Figure 3 and Figure 4 present the operationalizing variables used in the study of the occurrence of risks, grouped according to the source.

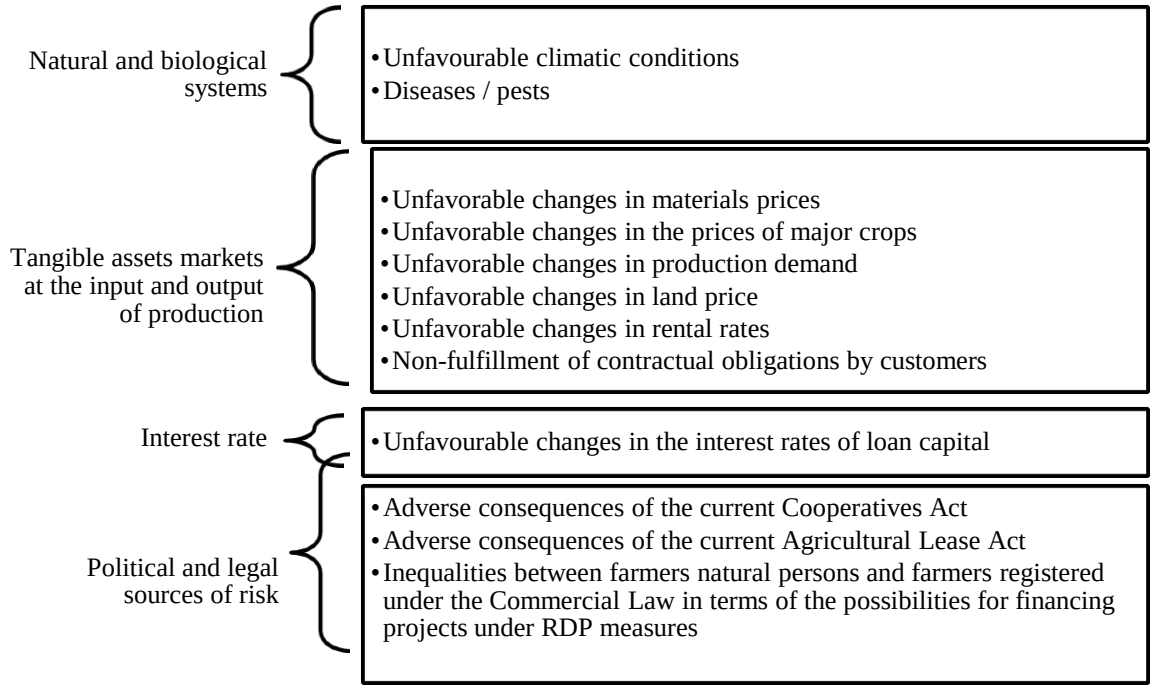

Figure 3. Operationalizing variables of risks with external sources of occurrence

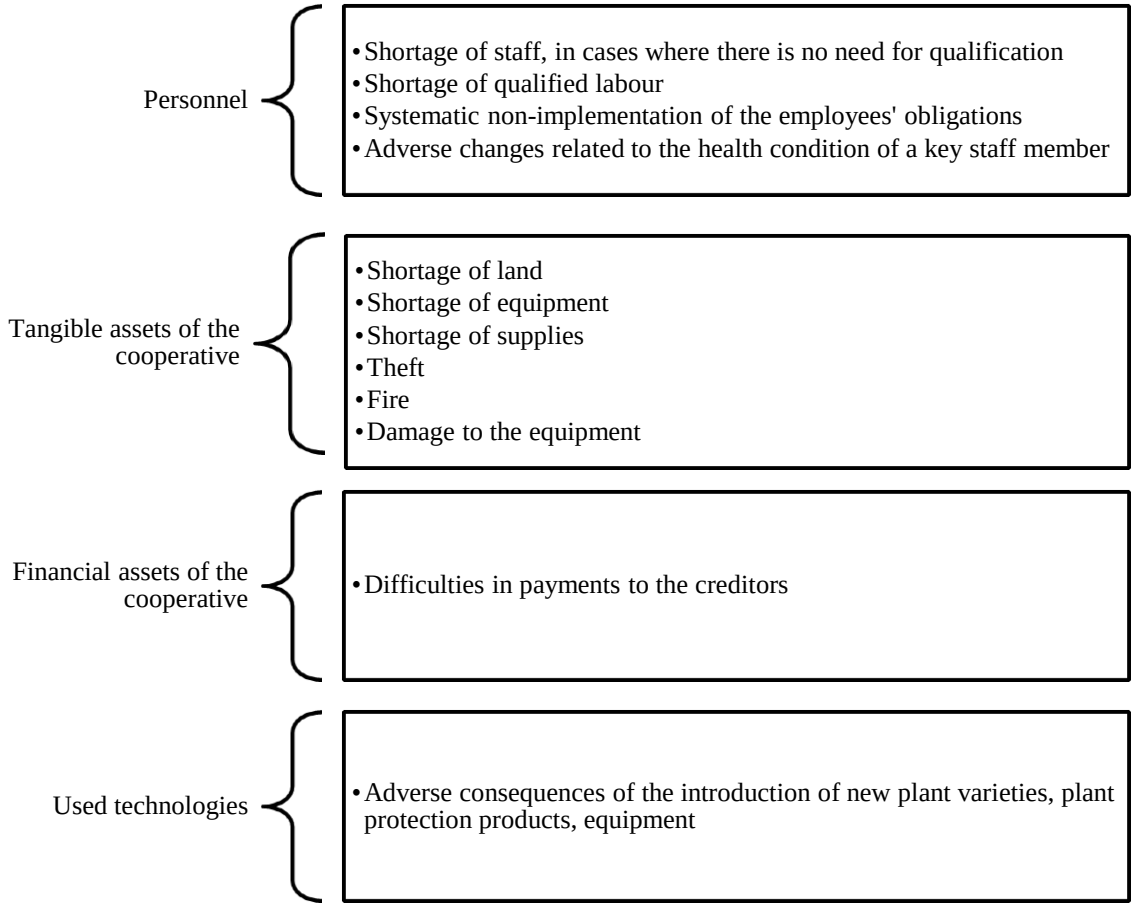

Figure 4. Operationalizing variables of risks with internal sources of occurrence

RESULTS

Table 1 summarizes indicators for average level and dispersion of risks arising from natural and biological systems. According to respondents, climatic risks occur relatively frequently in their activity (this conclusion is based on the value of the "arithmetic mean" of the scales expressing the occurrence of the risk). The other types of risk in this group arise relatively less often, namely diseases and pests on the plants and animals.

Table 1. *Average level and dispersion indicators of the frequency of occurrence of unfavourable climatic conditions and diseases /pests*

		Unfavourable environmental and climatic conditions	Diseases and/or pests
N	Valid	38	36
	Missing	4	6
Mean		3,1316	2,7778
Mode		5,00	2,00
Std. Deviation		1,52760	1,33333
Minimum		1,00	1,00
Maximum		5,00	5,00

Table 2 shows the correlational matrix for the variables "Frequency of occurrence of unfavourable climatic conditions" and "Frequency of occurrence of diseases / pests".

There is a regular, significant dependence between farmers' assessments of the frequency of the discussed risk types[1] i.e. higher frequency of occurrence of one risk assessed by farmers is reasonably related to higher estimates of the frequency of the other risk.

[1] The following scales of the correlation coefficients evaluation are used in the paper: 0,9-1,0 (very strong connection), 0,7-0,9 (strong), 0,5-0,7 (considerable), 0,3 – 0,5 (average), 0,0 – 0,3 (poor)

Table 2. *Correlational matrix for the variables "Frequency of occurrence of unfavourable climatic conditions" and "Frequency of occurrence of diseases / pests".*

			Unfavourable environmental and climatic conditions	Diseases and/or pests
Spearman's rho	Unfavourable environmental and climatic conditions	Correlation Coefficient	1,000	,638**
		Sig. (2-tailed)	.	0,000
		N	38	35
	Diseases and/or pests	Correlation Coefficient	,638**	1,000
		Sig. (2-tailed)	,000	.
		N	35	36
**. Correlation is significant at the 0.01 level (2-tailed)				

In order to determine the extent to which these two issues are consistent with their stated objective of measuring the occurrence of risks arising from natural and biological systems, a reliability test of the scales was performed using Kronbach's α coefficient. Based on the test results, we assume that the two variables can be successfully used together to measure the discussed theoretical construct (Cronbach's Alpha = 0,779)[2].

The external risk identified as the most frequently occurring is the one caused by the impact of market forces. This is the risk associated with unfavorable changes in the prices of the main crops **(Table 3)**. Other relatively common risks in this group relate to changes in materials prices, land price, and the amount of land lease. Relatively rarely occurring market risks arise from customer defaulting on contracted obligations. Nearly one quarter of respondents have never encountered similar situations. The six operationalizing variables formulated to measure the frequency of occurrence of risks deriving from market forces have excellent internal consistency (Chronbach's α = 0.849). Therefore, respondents provide very consistent assessments of the frequency of occurrence of the six types of risk, allowing data on the occurrence of market risks to be summarised.

Table 3. *Average level and dispersion indicators of the frequency of occurrence of unfavourable market / price changes*

		Unfavourable changes in the prices of materials	Unfavourable changes in the prices of the main crops	Unfavourable changes in the production demand	Unfavourable changes in land prices	Unfavourable changes in the land lease	Customers defaulting on contractual obligations
N	Valid	39	39	39	35	34	32
	Missing	3	3	3	7	8	10
Mean		3,8205	4,1026	2,6410	3,4571	3,3235	1,5625
Mode		4,00	5,00	4,00	4,00	4,00	1,00
Std. Deviation		,94233	1,20950	1,28733	1,35783	1,24853	,84003
Minimum		1,00	1,00	1,00	1,00	1,00	1,00
Maximum		5,00	5,00	5,00	5,00	5,00	4,00

In general, over the last five years, the management of agricultural cooperatives has encountered relatively rarely risks of a financial nature. The latter concerns both internal financial risks (difficulties in repaying liabilities to creditors) and financial risks arising from the impact of external forces on the cooperatives (adverse changes in interest rates on borrowed capital). Slightly over 40% of respondents have never faced such risk situations over the past five years **(Table 4).**

[2] We assume that the reliability of the scale is satisfactory when α is in the range 0,5 -1,0

Table 4. *Average level and dispersion indicators of the frequency of occurrence of unfavourable changes in the interest rates and difficulties in repaying liabilities to creditors*

		Unfavourable changes in the interest rates of borrowed capital	Difficulties in repaying liabilities to creditors
N	Valid	24	25
	Missing	18	17
Mean		1,6667	1,9200
Mode		1,00	1,00
Std. Deviation		,96309	1,07703
Minimum		1,00	1,00
Maximum		4,00	5,00

There is no established link between the assessments of the frequency of occurrence of internal and external risks for the cooperatives **(Table 4).**

There is no consistency in the respondents' estimates on both scales, which prevents the data on both types of financial risk from being aggregated into one group of factors (Cronbach's Alpha = 0.055).
The management of cooperatives indicates that they are relatively often faced with adverse consequences stemming from the impact of the Cooperatives Act (CA). The existing Farm Lease Act (FLA) also often hinders the achievement of the objectives of these market players. 81% of respondents testify to a certain level of inequality in terms of funding opportunities for rural development program (RDP) projects. The largest number of farmers indicate that they fall into the said unfavorable situation "rather often" **(Table 5).**

Table 5. *Average level and dispersion indicators of the frequency of occurrence of unfavourable consequences for the cooperative, stemming from the agricultural policy*

		Frequency of unfavourable consequences of the current FLA	Frequency of unfavourable consequences of the current CA	Frequency of inequalities in terms of funding opportunities for RDP projects
N	Valid	38	35	34
	Missing	4	7	8
Mean		3,1579	3,3714	2,8824
Mode		4,00	4,00	4,00
Std. Deviation		1,30542	1,26225	1,36548
Minimum		1,00	1,00	1,00
Maximum		5,00	5,00	5,00

It can be assumed that the estimates for the three discussed variables are consistent and can be successfully summarized to measure the level of institutional risk (Cronbach's Alpha = 0.719).

The most common risk arising from the number and quality of staff is the labor shortage. In the last 5 years, about 76% of respondents have been making decisions in unfavorable situations related to shortages of skilled and / or unskilled labor. Less frequent are issues related to the discipline at the workplace (systematic failure to perform duties) and health problems of a key staff member **(Table 6).** Over 30% of respondents did not face the said health risk over the last five years. The frequency of occurrence of that risk is estimated by the highest number of respondents as "rare".

The test of reliability of the theoretical construction shows an unsatisfactory level of internal consistency of the respondents' estimates for the four operationalizing variables (Cronbach's Alpha = 0,394). Therefore, it is not appropriate to summarize the four types of personnel risk to measure the frequency of occurrence of one group of risks.

Table 6. *Average level and dispersion indicators of the frequency of occurrence of unfavourable changes related to the number and quality of staff*

		Unfavourable changes, related to the health condition of a key staff member	Shortage of skilled labour	Shortage of unskilled labour	Systematic failure to perform duties
N	Valid	29	34	32	31
	Missing	13	8	10	11
Mean		1,3793	2,5588	2,8438	1,8065
Mode		1,00	1,00	3,00	1,00
Std. Deviation		,67685	1,54118	1,43930	1,19497
Minimum		1,00	1,00	1,00	1,00
Maximum		3,00	5,00	5,00	5,00

The internal consistency of responses to three of the four questions, namely shortages of skilled and unskilled labor and the situations of systemic failure on the part of staff to perform duties are considered satisfactory(Cronbach's Alpha = 0,519).

Among the risks arising from the quantity and quality of tangible assets used by cooperatives, the most common are the shortage of land, damage to equipment and lack of equipment. However, it should be noted that approximately one third of respondents have never encountered similar situations over the past 5 years. Farmers who have suffered these risk events note that this has happened relatively rarely **(Table 7).**

Table 7. *Average level and dispersion indicators of the evaluations concerning the frequency of occurrence of risks related to tangible assets*

		Shortage of land	Shortage of equipment	Shortage of materials	Theft	Fire	Equipment failure
N	Valid	27	28	26	30	17	34
	Missing	15	14	16	12	25	8
Mean		2,5926	2,1071	1,5385	1,6000	1,2353	2,2941
Mode		1,00	1,00	1,00	1,00	1,00	1,00
Std. Deviation		1,52566	1,42307	,94787	,93218	,56230	1,50815
Minimum		1,00	1,00	1,00	,00	1,00	1,00
Maximum		5,00	5,00	5,00	4,00	3,00	5,00

Regular connections have been established between the frequencies of occurrence of some of the risks associated with the quantity and quality of the tangible assets, including shortage of equipment and material shortages, equipment failure and shortage of equipment, theft and shortage of materials, etc. **(Table 8**).

The level of technological risk, measured by the frequency of failures in the implementation of innovation, is relatively low. Respondents most often point out that they rarely encounter such obstacles **(Table 9).**

As a result of the performed calculations, empirical models of internal and external sources of risk to the agricultural cooperatives operating on the territory of northeastern Bulgaria are presented **(Figure 5 and Figure 6).**

Table 8. *Correlation matrix for variables expressing the frequency of occurrence of different types of property risk*

	Shortage of land	Shortage of equipment	Shortage of materials	Theft	Fire	Equipment failure
Spearman's rho	1,000	,408*	,469*	,143	-,206	-,006
	.	,048	,032	,504	,499	,977
	27	24	21	24	13	26
	,408*	1,000	,704**	,496*	,041	,569**
	,048	.	,000	,014	,894	,002
	24	28	25	24	13	26
	,469*	,704**	1,000	,514*	,246	,462*
	,032	,000	.	,015	,441	,023
	21	25	26	22	12	24
	,143	,496*	,514*	1,000	,430	,019
	,504	,014	,015	.	,085	,925
	24	24	22	30	17	27
	-,206	,041	,246	,430	1,000	-,098
	,499	,894	,441	,085	.	,718
	13	13	12	17	17	16
	-,006	,569**	,462*	,019	-,098	1,000
	,977	,002	,023	,925	,718	.
	26	26	24	27	16	34

**. Correlation is significant at the 0.01 level (2-tailed)

Table 9. *Average level and dispersion indicators of the frequency of occurrence of technological risks*

N	Valid	35
	Missing	7
Mean		1,7143
Mode		1,00[a]
Std. Deviation		,71007
Minimum		1,00
Maximum		3,00

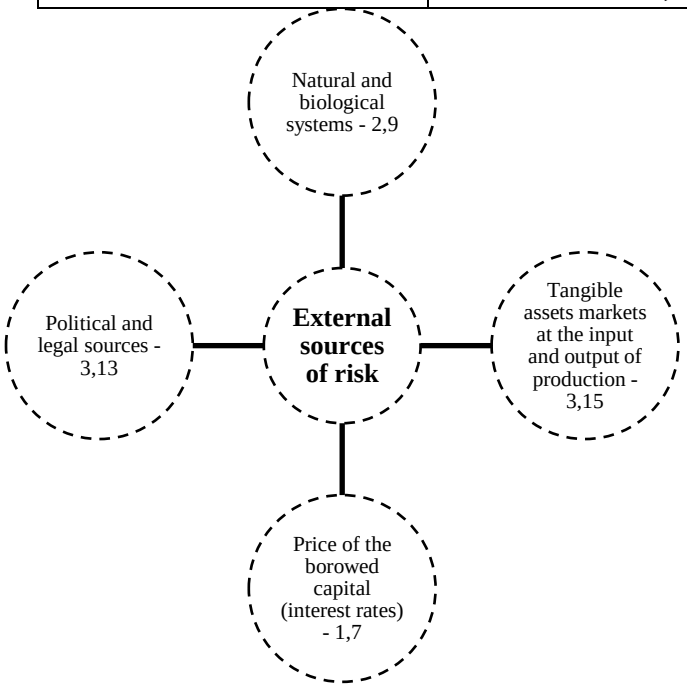

Figure 5. Empirical model of the external sources of risk faced by the studied agricultural cooperatives

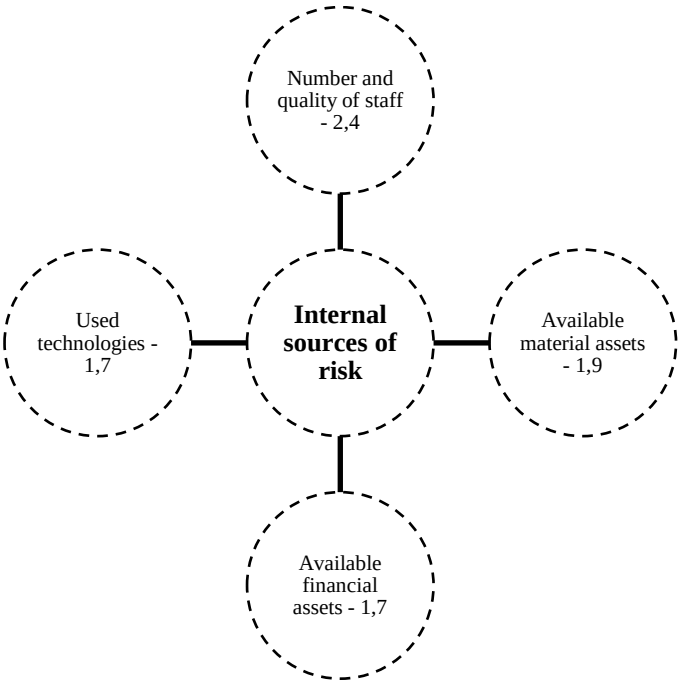

Figure 6. Empirical model of the internal sources of risk faced by the studied agricultural cooperatives

CONCLUSIONS

On the basis of the analyzes and generalizations carried out, the following conclusions have been drawn:

First, the external sources of risk faced by the studied organizations can be successfully addressed in four groups - markets at the input and output of production; political and legal sources, natural and biological systems, access to loan capital. Internal sources of risk can be grouped as follows: number and quality of staff, available tangible assets, financial security of the cooperative and used technologies.

Secondly, the studied cooperatives fall more often in risk situations arising from external sources. Some of these risks are related to the specifics of the agricultural production, others - to the peculiarities of the political and legal environment in which the cooperatives in the Republic of Bulgaria operate.

Thirdly, the input and output markets of agricultural production are most often referred to by the cooperatives management as an external risks source. This highlights the question of the possibilities of expanding the functions of cooperatives' associations, including for the purchase of raw materials, the joint realization of production, the support for vertical integration of production and the participation of cooperatives on the market of processed products with their own brand, etc. At present, cooperatives rely mainly on grain production, their tendency to diversify production is relatively low. There are no co-operative structures to engage in commodity trading, market search, and so on.

Fourthly, among the most frequently mentioned sources of risk to the agricultural cooperatives is the political and legal environment in which they operate. One of the most commented barriers to the sustainability of cooperatives is that there is no obligation for cooperative members that their land is used only by the cooperative they are member of. There are many cases where cooperative members lease most of their land to other farmers motivated by higher rents. Another legal issue is related to the financial reporting of cooperatives. The National Union of Agricultural Cooperatives has been authorized to perform financial audits of the cooperatives on a paid basis. Practically no one can do a financial audit of cooperatives outside the Union unless the prosecution orders one. This has negative consequences in several ways: on the one hand, being a private structure, the agricultural cooperative must protect the interests and property of the landowners. On the other hand, the effectiveness of control is important for the confidence of landowners and members of cooperatives and hence for the competitiveness of these structures. Another feature of the legal and regulatory environment in which agricultural cooperatives operate in Bulgaria is that these organizations enjoy no privileges regarding the application for projects under the RDP 2014-2020. The Program provides for an association measure in which the agricultural cooperatives cannot participate. The management of cooperatives

argue that it is not fair to support some organizations that operate on the basis of cooperative principles and not to support other collective investments. Other issues that reduce public confidence in cooperatives are gradually finding their solutions. Such are the re-leasing of agricultural land and the possibility of concluding lease agreements regardless of the owned relative share of the plot.

In conclusion, the agricultural cooperatives have an important social and economic importance for the country's agriculture. These entities are faced with a number of risks stemming, on the one hand, from the specific nature of agricultural production and, on the other hand, from the specificities of the legal arrangements governing the cooperative form of organization and the social capital of those market participants. Effective coping with the unfavorable situations arising from the discussed risk sources is important for the competitiveness of cooperatives in the different regions of the Republic of Bulgaria.

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