RISK ANALYSIS IN AGRICULTURE

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***Abstract**: In the current national and global context, the activity of organizations is exposed to a series of risks generated by the market mechanisms and the climate change that have a significant impact on agricultural productivity. Thus, special attention is required to identify and control the potential risks, identify the causes and reduce the risk through specific measures. The objective of this article is to highlight the ways of risk analysis and its implications on agriculture. This article develops a theoretical framework on climate risk as well as economic and financial risk, an extensive case study, for a period of four consecutive years, regarding the calculation and analysis of the economic and financial indicators of risk in agriculture. The research highlights the importance of risk diagnosis in agriculture through both methods: economic method and financial method to which are added the climatic features that significantly influence the level and dynamics of the risk.*

***Key words**:agriculture, economic risk, financial risk, climate risk.*

***JEL Code**: M21, Q12, D81*

1. Introduction

The agricultural production is vulnerable to various risks that can vary widely, with an impact on farmers' incomes and their ability to pay loans and cover other key costs. The risk factors refer to the high dependence on natural conditions such as precipitation, temperature variations, plant diseases, etc. and price volatility due to the changes in market conditions. Crop insurance can be an effective way of financial protection, the various risks involved in agriculture (leading to crop losses and income reductions) can be significantly reduced [13].

The studies/strategies/specialized programs as well as the past and present reality reveal the fact that in Romania the extreme weather phenomena will be more and more accentuated, which will affect the the food needs of the population. For these reasons is required an efficient climate risk management.

The economic sector is directly influenced by the variation of climatic factors is agriculture, having a significant impact on the vegetal sector and animal husbandry (getting animal feed, ensuring the necessary climate conditions for animals). Preventing and eliminating the negative effects of climate factors requires significant spending, which in many cases can affect the farm profitability.

Romania has important agricultural resources, having a significant contribution to the national economy, which is why it is necessary to properly manage the climate risks by complying with the national and european regulations and taking the necessary measures to reduce this risk.

The results obtained by agricultural holdings are influenced by a number of factors, such as: competition, technological progress, rising prices, natural factors, the cost structure and their behavior towards the volume of activity.

2. Research methodology

This article combines qualitative and quantitative research. We chose a general to specific approach, starting from a theoretical presentation of the current state of knowledge and continuing with the case studies based on data analysis and interpretation.

The first part of this research presents some theoretical aspects of risk in general, the implications of climate risk in agriculture and methods of risk analysis. As the main research

technique is used the literature review procedure, the documentation within the relevant literature, the study of works in the field, various books, articles, websites, etc.

Considering the importance of risk determination, two complex methods of analysis and interpretation were chosen: the first method refers to the analysis of economic risk using a set of specific indicators and the second method is materialized in the analysis of financial risk. In the first phase, the theoretical documentation on each category of indicators was performed, then an organization with an agricultural profile was identified, subsequently, the indicators were calculated for four consecutive years. The motivation for which it was chosen to perform a risk analysis for a period of four years is that it follows the evolution of the financial situation of the organization, its trends. The last stage consists in the analysis and interpretation of the calculated indicators: variable expenditure margin, breakeven, the absolute and relative position indicator, the elasticity coefficient, financial leverage, etc.

This research complements the results of a previous study conducted by the author, which refers to models for analyzing the bankruptcy risk of in agriculture [4].

The research hypotheses that we intend to verify are:

I1-the use of indicators specific to a certain method (either by indicators specific to economic risk or financial risk) provides sufficient data for diagnosing the risk of agricultural organizations;

I2-diagnosing the risk of organizations with an agricultural profile, in order to provide a complete picture, must take into account both the indicators specific to economic risk and those specific to financial risk.

3. Risk- concept and implications

In a general sense, the risk is a measure of the uncertainty involved by an investment. The risk analysis aims at the uncertainty of future flows at the level of the enterprise or of the capital sources (debts, common shares, etc.) [11].

Another definition of risk refers to "the inability of a company to adapt in time, at the lowest cost and to the environment changes" [5].

One of the suggestive definitions of the risk is given by the Professor Alexandru Buglea, the possibility that a future action will cause losses that will affect the patrimony, activity and results of an organization [1].

Some approaches consider that risk can lead to both losses and gains. For this point of view, the risk expresses the possibility of disparities (favorable, unfavorable) between the expected and the obtained level of future actions [2].

The total risk that any business faces is defined as the variability of the return on equity. For corporate firms this will be reflected in the variability of share prices, and for owners this will be reflected in the variability of equity or net worth [9]. The business risk refers to the variability of the company's assets profitability and is due to the volatility of goods and services on the market, as well as the volatility of the costs of the goods sold [6].

In our opinion, the risk in agriculture can be defined as the variability of economic and financial results of the agricultural holdings due to the unbalance of the market requirements, as well as the actions of several factors: natural, economic, social, political, information factors.

The causes that generate the risk within the organizations can be multiple: particularities of the activities carried out, the competition, the economic conjuncture, the relations with customers/suppliers, inexactness information, natural calamity [2].

The profitability and risk are fundamental concepts on which depends the financial decisions taken by the management of agricultural holdings. Profitability and risk are in a relationship of proportionality, if profitability is high the risk will increase in the same direction.

Regarding the typology of risk, there is no standard classification of them in the literature. From the existing risk categories, we consider that the most significant for agricultural holdings are: economic risk, financial risk and bankruptcy risk.

4. Implications of climate risk in agriculture

The climate risk is a form of risk manifestation in business, with negative consequences on organizations in various sectors of activity but especially on agriculture. According to the V Report of the Intergovernmental Panel on Climate Change, in the recent years there is a growing trend of global warming, the period between 2001-2013 being considered one of the warmest since 1850 [18]. Also, the variation of atmospheric phenomena is more and more accentuated being characterized by the increase of the extreme events such as long periods of drought followed by heavy rainfall, floods, other similar phenomena.

The agriculture influences climate change by producing two strong greenhouse gases [19]:

- methane (CH4) -from animal digestion processes and storage of stable manure
- nitric oxide (N2O) - from organic and mineral fertilizers.

In this context, the impact of climate change on agriculture is significant, which is why ensuring the water resources, the crop stability and the food security are major concerns in national and European policies.

At EU level, environmental and climate issues in agriculture are an essential part of the Common Agricultural Policy (CAP) 2021-2027, representing one of the priorities, so that, according to the current legal framework, at least 30% of the budget of the European Agricultural Fund Rural Development will be used for environmental and climate investments.

The importance given to climate risk management in agriculture is also highlighted by the fact that within the National Rural Development Program 2014-2020 are provided three measures to improve climate issues: M10-Environment and climate, M15-Forestry services, climate services and forest conservation, M17-Risk management.

The National Climate Change Strategy approach two strategic directions on climate risk management[17]:

- reducing greenhouse gas emissions and increasing the natural capacity to absorb CO2 from the atmosphere;
- adaptation to the effects of climate change.

Climate risk management involves three successive stages [20]: risk assessment in order to take substantiated decisions; risk reduction through planning and training; risk sharing and transfer in the context of their adoption.

5. Economic risk analysis - concept and methods

The economic risk or exploitation risk is determined by the inability of the organization to adapt in time and at the lowest cost to the environment changes in which it operates [2].

It is considered that the economic risk of the company can be assessed using certain indicators: the contribution of the margin ratio, the break-even point, the safety margin, the operational debt etc [16].

A significant indicator for economic risk analysis is the operational debt. This indicator expresses the sensitivity of the company's result to the variation of the activity (sales or production). The degree of operational debt quantifies the impact of a particular cost structure on changes in earnings before interest and taxes [10].

The economic risk refers to the possibility of losses due to the development of an inefficient production activity, the evolution of the ratio between fixed and variable costs. The economic risk is directly linked to the importance of fixed costs, which diminish the organization's flexibility and its ability to adapt to variation of the turnover [14].

The exploitation risk can be estimated using the *break-even point,* also called critical point or equilibrium point and refers to that activity of agricultural holdings in which income from the sale

of goods, products, services is equal to expenditure (fixed and variable), the profit being null. The equation on which the break-even point analysis methodology is based:

Total income=Variable expenses + Fixed expenses, Profit = 0.

Given the importance of fixed and variable costs, some clarifications are needed: fixed costs are variable per unit of product, they decrease if the volume of activity is increasing; the variable costs increase in direct proportion to the volume of activity [7].

The method of calculating and analyzing the break-even point is different depending on how the analysis is performed: by product or by total organization [12]. The indicators for measuring the break-even point in the case of a *single product* (homogeneous activity) are:

- Critical physical volume of production

$$q_{cr} = \frac{cf}{p - cv} \quad (1)$$

- Critical turnover refers to the volume of sales for which the profit is zero

$$CA_{cr} = q_{cr} x p \quad (2)$$

- Critical degree of production capacity utilization

$$G_{cr} = \frac{q_{cr}}{q_{\max}} x100 \quad (3)$$

- Critical period

$$p_{cr} = \frac{CA_{cr}}{CA/T} \quad (4)$$

cf- fixed costs per product

p- unit selling price

q_{max} –maximum production capacity in physical expression

CA/T- average sales per unit of time (day, month, year)

The indicators for measuring the break-even point when the organization produces a wide range of products are:

- Critical turnover

$$CA_{cr} = \frac{Cf}{1 - \overline{cv}} \quad (5)$$

- Critical degree of production capacity utilization

$$G_{cr} = \frac{CA_{cr}}{Q_{\max}} x100 \quad (6)$$

Cf- fixed expenses at enterprise level

$\overline{cv}$ - average variable expenses per leu turnover

Q_{max} –maximum production capacity in value expression

$$Q_{\max} = \Sigma q_{i\max} p_i \quad (7)$$

Starting from the break-even point model, the exploitation risk assessment can be performed by the *position indicators* that express the organization's ability to vary its production and to adapt to market requirements. As the value of this indicator increases, the economic risk decreases [14].

The position indicators can be calculated [15]:

- absolutely- the safety margin (Ms) is also called absolute flexibility and shows the ability of the farm to adapt to market requirements by changing the level of production. Thus, the higher the flexibility is, the lower the risk of exploitation is.
- relativity - the safety index (Is) also called volatility coefficient.

$$M_s = CA - CA_{pr} \quad (8)$$

$$I_s = \frac{CA}{CA_{pr}} x100 \quad (9)$$

The relative deviation of the safety index can be determined as follows:

$$\Delta I_s = I_s - 100 = \frac{CA - CA_{pr}}{CA_{pr}} x100 \quad (10)$$

The studies conducted on the model of Western economies, estimate that the situation of comanies in relation to the break-even point can be [2]:

- Unstable if the turnover is up to 10% higher the global break-even point;
- Stable if the turnover is up to 20% higher than the global break-even point;
- Comfortable if the turnover exceeds the break-even point by over 20%.

For the analysis of the economic risk, a special importance is the calculation of the break-even point in days (PRzile), the time in which the organization achieves a turnover corresponding to the break-even point. Bringing the break-even point close to the value of 365 days means increasing the exploitation risk, and conversely, moving away from this value means reducing the risk [3].

$$PR_{zile} = \frac{CA_{pr}}{CA} x365 \quad (11)$$

The assessment of economic risk can also be achieved through the *coefficient of elasticity* (e), which refers to the sensitivity of the operating result to the changes in the volume of activity, and is determined according to the relationship [14].

$$e = \frac{\frac{\Delta RE}{RE}}{\frac{\Delta CA}{CA}} \quad (12)$$

RE- operating result
CA- expected turnover.
There is the following relationship between the coefficient of elasticity and the break-even point, the level of activity for which the operating result is zero:

$$e = \frac{\frac{RE - RE_{PR}}{RE}}{\frac{CA - CA_{PR}}{CA}} = \frac{CA}{CA - CA_{PR}} \quad (13)$$

RE_{PR}- the exploitation result in the critical point
CA- expected turnover.
There is a directly proportional relationship between the coefficient of elasticity and the break-even point, so the further the organization moves away from the break-even point the coefficient of elasticity is lower, so the exploitation risk is lower.
Depending on the value of the coefficient of elasticity, the organization may be in one of the following situations [2]:

- Unstable, with a high economic risk, if it is> 11;

- Relatively stable, if e≈6;
- Comfortable, low risk, if <6.

Given that the operating risk is generated by the operating activity, in practice the operating incomes are used instead of the turnover.

Within the analyzed agricultural holding, the evolution of the indicators that are expressing the economic risk are presented in table no. 1.

Tabel no.1: Economic risk

No.	Indicators	UM	Period			
			year 1	year 2	year 3	year 4
1	Operating income	lei	4.743.962	4.962.860	4.995.979	5.755.499
2	Operating expenses	lei	4.349.131	4.743.829	4.824.340	5.282.282
3	Operating profit: 1-2	lei	394.831	219.031	171.639	473.217
4	Total variable expenses	lei	3.414.308	3.559.960	3.646.164	4.068.455
5	Total fixed expenses	lei	934.823	1.183.869	1.178.176	1.213.827
6	Variable expenditure margin: 1-4	lei	1.329.654	1.402.900	1.349.815	1.687.044
7	Variable expense margin rate 6:1	%	28,03	28,27	27,02	29,31
8	Break even point: 5:7	lei	3.335.277	4.188.022	4.360.703	4.141.078
9	Absolute position indicator: 1-8	lei	1.408.685	774.838	635.276	1.614.421
10	Relative position indicator: 9/8	%	42,24	18,50	14,57	38,99
11	The moment of the Break even point	days	257	308	319	256
12	Coefficient of elasticity		3,37	6,41	7,86	3,57

Source: author's view based on the financial data of the organization

Analyzing the data from table no. 1, we observe that the break-even point has high values compared to the level of agricultural activity (operating income), increasing significantly in year 2-year 5 compared to year 1. Thus, as the level of agricultural activity comes to the break-even point, the economic risk increases and the profitability decreases.

If we refer to the time interval (no. of days) in which the agricultural holding achieves a turnover corresponding to the break-even point, it is found that the exploitation risk is high and continuously increasing because, in our case the moment of achieving the break-even point is close to 365 days, the highest value being registered in year 3, respectively 319 days.

It is found that the absolute and relative position indicator registers a significant decrease during the years 2-4 compared to year 1, it increases slightly in year 4, situation that highlights the increase of the exploitation risk. However, the assessment of the economic risk based on the break-even point reveals that the *agricultural holding is stable*, in the most cases the turnover being up to 20% higher than the global break-even point, respectively in year 1 the turnover is higher than break-even point by 42.24%, in year 2 by 18.5%, in year 3 by 14.57%, in year 4 by 38.99%. It is found that in years 1 and 4 the turnover exceeds over 20% the level of break-even point, so that the organization is in a much more comfortable position.

The level of the elasticity coefficient of the agricultural holding, in the analyzed period, varies between 3.37 and 7.86, which highlights a *medium economic risk*.

6. Financial risk analysis- concept and methods

In the literature, financial risk is defined as the variability of result indicators due to the financial structure of the organization (Achim, Borlea, 2014; Burja, 2009; Buglea, 2011; Isaic-Maniu, 2003; Troie, Zaharia, Roman, Hurdezeu, 2003; Stancu, 2002). The capital of organizations consists of two components: equity and borrowed capital (debts). Borrowed capital is interest-

bearing, which incurs additional expenses compared to equity. For this reason, borrowed capital determines the variability of results, and therefore changes the financial risk. At the same time, the credits can lead to the return increased, which if it is higher than the cost of borrowed capital, the farm is advantaged.

The organization i sunder a financial risk when the loans does not generate efficiency, ie when the rate of economic return is lower than the interest rate of the borrowed capital [2].

The most used indicators of financial risk analysis are: global break-even point, financial leverage, analysis of financial profitability through leverage

The global break-even point is calculated by the relationship:

$$CA_{pr} = \frac{CF + Dob}{1 - cv} = \frac{CF + Dob}{Rmcv} \quad (14)$$

CF- fixed expenditure

Dob- interest

Rmcv- variable expense margin rate.

The assessment of the financial risk is made on the same indicators as in the case of the operating risk: safety margin, safety index, elasticity coefficient.

Table no.2: Financial risk based on the break-even point

No	Indicators	UM	Period			
			year 1	year 2	year 3	year 4
1	Operating income	lei	4.743.962	4.962.860	4.995.979	5.755.499
2	Operating expenses	lei	4.349.131	4.743.829	4.824.340	5.282.282
3	Operating profit: 1-2	lei	394.831	219.031	171.639	473.217
4	Total variable expenses	lei	3.414.308	3.559.960	3.646.164	4.068.455
5	Total fixed expenses	lei	934.823	1.183.869	1.178.176	1.213.827
6	Interest expenses	lei	324.542	152.541	148.746	465.195
7	The result after paying interest:3-6	lei	70.289	66.490	22.893	8.022
8	Variable expenditure margin: 1-4	lei	1.329,654	1.402,900	1.349.815	1.687.044
9	Variable expense margin rate: 8:1	%	28,03	28,27	27,02	29,31
10	Break even point: 5+6/9	lei	4.493.184	4.727.647	4.911.247	5.728.131
11	Absolute position indicator: 1-10	lei	250.778	235.213	84.732	27.368
12	Relative position indicator: 11/10	%	5,58	4,98	1,73	0,48
13	The moment of the Break even point	Days	346	348	359	363
14	Coefficient of elasticity	-	18,92	21,10	58,96	210,30

Source: author's view based on the financial data of the organization

Analyzing the data from table no. 2, we notice that the break-even point has values that are very close to the value of the exploitation activity due to the significant influence of interest expenses, so that the *financial risk of the agricultural exploitation is very high*. Another indication of the high financial risk refers to the fact that the global break-even point is reached after a very large number of days, ie in about 345 days.

The analysis of the elasticity coefficient and the position indicator reveals that the agricultural holding is subject to an extremely high financial risk because the level of the elasticity coefficient is very high and constantly increasing; turnover is only up to 6% higher than the global break-even point. The high financial risk of the farm is due to very high interest expenses.

The "leverage effect" quantifies the impact of the loans used by the organization on the return on equity, being a function of the economic rate of return and the cost of debt.

The most suggestive presentation of the financial leverage effect is shown in figure no.1.

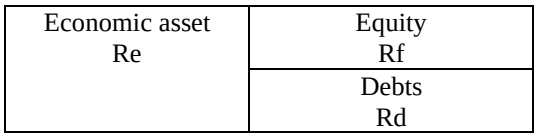

Figure no.1: **Balance sheet and profitability structure**

Source: Nicolae Todea, Camelia Burja, Vasile Burja, Sorin-Constantin Deaconu, *Gestiunea si contabilitatea exploataţiilor agricole*, Editura Risoprint, Cluj-Napoca, 2005, p. 181

From the above scheme it results that the economic asset (Ae) corresponds to the economic rate of return (Re), equity (Kpr) – financial rate of return, debts (Dat)- the rate of interest (Rd).
The result (Rex) can be calculated according to the formula below, in this case the exceptional result, financial income and income tax are not taken into account.

$$\mathrm{Re}\,x = Operatingresults\,(RE) - Debts\,(Dob) \quad (15)$$

$$Dob = Dat\,x\,Rd \quad (16)$$

Based on these elements, several indicators can be calculated directly related to leverage [15]:

- The operating result can be calculated according to the economic rate of return:

$$\mathrm{Re} = \frac{RE}{Ae} \quad (17)$$

it follows that *RE=Ae x Re*

- The financial rate of return can be calculated as the ratio between the net result and equity:

$$Rf = \frac{\mathrm{Re}\,x}{Kpr} = \frac{RE - Dob}{Kpr} = \frac{AE\,x\,\mathrm{Re} - Dat\,x\,Rd}{Kpr} = \frac{(Kpr + Dat)\,x\,\mathrm{Re} - Dat\,x\,Rd}{Kpr} \quad (18)$$

$$Rf = \mathrm{Re} + (\mathrm{Re} - Rd)\,x\,\frac{Dat}{Kpr} \quad (19)$$

It follows that:

$\frac{Dat}{Kpr}$ represents the financial leverage

$(\mathrm{Re} - Rd)\,x\,\frac{Dat}{Kpr}$ represents the leverage effect of indebtedness.

The correlation between the economic rate of return- financial rate of return –the interest rate, is expressed through three relations [8]:

- Re>Rd- the situation is favorable, in this case the debts has a beneficial effect on the organization because the economic rate of return covers the interest rate. The financial profitability is an increasing function depending on the degree of indebtedness of the company, Rf> Rd
- Rd> Re- in this case the indebtedness has a negative effect, the financial risk is increasing. In this case, the economic rate of return does not cover the interest rate of the borrowed capital. The financial profitability is a decreasing function of the degree of indebtedness.
- Re=Rd- indebtedness is perceived as neutral. Equality means the profitability of the financial structure. It follows that indebtedness increases the risk.

Table no. 3: Financial leverage

No.	Indicators	UM	Period			
			year 1	year 2	year 3	year 4
1	Equity	lei	3.588.634	3.648.400	3.764.213	3.776.857
2	Financial debts	lei	2.896.073	2.438.681	3.171.118	3.450.749
3	Invested capital: 1+2 (Economic asset)	lei	6.484.707	6.087.081	6.935.331	7.227.606
4	Operating profit	lei	394.831	219.031	171.639	473.217
5	Interest expenses	lei	324.542	152.541	148.746	465.195
6	The result after the payment of interest	lei	70.289	66.490	22.893	8.022
7	Economic return: 4:3	%	6,09	3,60	2,47	6,55
8	Average cost of borrowed capital 5:2	%	11,21	6,26	4,69	13,48
9	Level of indebtedness: 2:1	%	80,70	66,84	84,24	91,37
10	Leverage effect: (7-8)*9	%	-4,13	-1,78	-1,87	-6,33
11	Financial return: 6:1	%	1,96	1,82	0,61	0,21

Source: author's view based on the financial data of the organization

The factorial analysis of the financial risk manifestation is performed according to the following model [3]:

$$Rf = \mathrm{Re} + (\mathrm{Re} - Rd)\,x\,Gi \quad (20)$$

Gi- represents the degree of indebtedness (financial leverage).
Depending on this model, financial profitability is influenced by two factors: the change in economic profitability on the dynamics of financial profitability; leverage effect changing.
The change in financial profitability is given by the relation:

$$\Delta Rf = Rf_1 - Rf_0 \quad (21)$$

$$\Delta Rf_{An1-An2} = 1{,}82 - 1{,}96 = -0{,}14$$

$$\Delta Rf_{An3-An4} = 0{,}21 - 0{,}61 = -0{,}4$$

1. The influence of changes in economic profitability on the dynamics of financial profitability:

$$\Delta Rf(\mathrm{Re}) = \Delta \mathrm{Re}$$

$$\Delta \mathrm{Re}_{An1-An2} = 3{,}60 - 6{,}9 = -3{,}3$$

$$\Delta \mathrm{Re}_{An3-An4} = 6{,}55 - 2{,}47 = 4{,}08$$

From which:

- The influence of the economic asset rotation.

$$\Delta Rf\left(\frac{CA}{AE}\right)=\left(\frac{CA_1}{AE_1}-\frac{CA_0}{AE_0}\right)x\frac{RE_0}{CA_0} \quad (22)$$

$$\Delta Rf\left(\frac{CA}{AE}\right)_{an1-an2}=0{,}02\%$$

$$\Delta Rf\left(\frac{CA}{AE}\right)_{an2-an3}=0{,}002\%$$

- The influence of commercial profitability

$$\Delta Rf\left(\frac{RE}{CA}\right)=\frac{CA_1}{AE_1}x\left(\frac{RE_1}{CA_1}-\frac{RE_0}{CA_0}\right) \quad (23)$$

$$\Delta Rf\left(\frac{RE}{CA}\right)_{an1-an2}=-0{,}04\%$$

$$\Delta Rf\left(\frac{RE}{CA}\right)_{an3-an4}=-0{,}007\%$$

1. The influence of leverage change

$$\Delta Rf\left[(\mathrm{Re}-Rd)xGi\right]=\Delta\left[(\mathrm{Re}-Rd)xGi\right] \quad 24)$$

$$\Delta Rf\left[(\mathrm{Re}-Rd)xGi\right]_{an1-an2}=2{,}35\%$$

From which:

- The influence of the gap between economic profitability and interest rates

$$\Delta Rf\left(\mathrm{Re}-Rd\right)=\Delta\left(\mathrm{Re}-Rd\right)xGi_0 \quad (25)$$

$$\Delta Rf\left(\mathrm{Re}-Rd\right)_{\mathrm{An1-An2}}=\left[(0{,}036-0{,}0626)-(0{,}0609-0{,}1122)x0{,}807\right]=0{,}020\%$$

$$\Delta Rf\left(\mathrm{Re}-Rd\right)_{\mathrm{An3-An4}}=\left[(0{,}0655-0{,}1348)-(0{,}0247-0{,}0469)x0{,}8424\right]=-0{,}040\%$$

- The influence of the financial structure

$$\Delta Rf\left(Gi\right)=\left(\mathrm{Re}_1-Rd_1\right)x\Delta Gi \quad (26)$$

$$\Delta Rf\left(Gi\right)_{\mathrm{An\ 1-An\ 2}}=-0{,}027(0{,}6684-0{,}807)=0{,}0037\%$$

$$\Delta Rf\left(Gi\right)_{\mathrm{An\ 3-An4}}=-0{,}069(0{,}9137-0{,}8424)=-0{,}0049\%$$

Analyzing the indicators from the table no. 3 shows an increase of the financial risk as well as an inefficient management of resources. The operating profit decreased significantly during the period except for year 4, the interest expenses remain at a very high level, economic and financial profitability are very low and constantly declining.

The decrease in financial profitability (by 6.95% in year 2 compared to year 1, by 65.08% in year 4 compared to year 3) is due to the influence of economic profitability, the influence of the leverage. In turn, economic profitability is positively influenced by the the asset turnover and negatively influenced by commercial profitability. It is found that the economic return is lower than the cost of borrowed capital, thus resultin that indebtedness has negative effects and financial risk increases. The leverage effect has negative values in the analyzed period, being negatively influenced by the gap between economic profitability and interest rate as well as by the financial structure.

7. Conclusions

The risk manifests itself at all levels of the organization, starting with the goals setting, making decisions about the activity of the organization. We consider that risk in general is closely related to the decisions and the profitability, so that any decision involves a certain degree of risk. From our point of view, the risk involves three successive stages: identifying the causes that generate the risk, analyzing and controlling the risk, reducing the risk. The causes of the risk can be multiple and differ depending on the field in which the organizations operate.

The agricultural holding analyzed during the four years presents a very high financial risk and a moderate economic risk. From our point of view, the measures to be taken to control and reduce the economic/operational risk are materialized in:

- Increasing and diversifying operating activities as well as improving its position on the break-even point;
- Reducing the variable costs and especially fixed costs while increasing the operating activity;
- Reducing the time in which the organization achieves a turnover corresponding to the break-even point;
- Increasing the safety margin which will increase the organization's ability to adapt to market requirements;
- Increasing the profitability of the organization by increasing sales and the efficiency of the production factors use, reducing production costs;
- Decreasing the break-even point, ie reducing the volume of activity for which the profit is zero.

Regarding the financial risk, we consider that the main directions that must be acted in order to reduce it are:

- Increasing and diversifying the operating activities as well as improving its position towards the break-even point;
- Reduction of interest expenses;
- Increasing the performance of the agricultural holding which will determine the increase of financial, economic and commercial profitability;
- Implementing appropriate marketing policies that increase commercial profitability and achieve a better market position;
- Increasing the asset turnover;
- The significant reduction of the degree of indebtedness which due to its very high level has negative effects, the interest rate being superior to the economic profitability.

In conclusion, due to the complexity of agricultural activity as well as the multitude of factors that influence the level and dynamics of agricultural production, the associated risks are multiple. The analysis of risk factors that influence the level of the results obtained, through economic and financial risk indicators, provides, on the one hand, a clear and detailed picture of the organization's situation, and on the other hand, determines the establishment of clear measures to reduce as much as possible these risks through appropriate measures. Risk analysis using specific indicators to either economic or financial risk does not provide sufficient data for making appropriate decisions, becouse each category of indicators provides valuable and distinct information for a correct

diagnosis of the risk. In this context, the research hypothesis no. 2 is verified an the research hypothesis no. 1 is not valid.

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