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DIAGNOSIS OF OPERATIONAL RISK IN RELATION TO BREAK-EVEN POINT AND FINANCIAL STRUCTURE OF THE ENTITY OF TWO AGRICULTURAL COMPANIES IN THE REPUBLIC OF MOLDOVA

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Abstract

The purpose of this research is to comparatively analyze the results of diagnosing the operational risk using the break-even method for agricultural enterprises in the Republic of Moldova. Our investigations have shown that the increased share of constant costs and expenses did not generate a high operational risk, given the fact that in the vicinity of the break-even point the elasticity of the operating result is low. The comparisons of the dynamics of rates of return and leverage showed the following: - the decrease of debt degree caused the attenuation of the downward trends of return on assets and return on equity, which indicates the reducing of capital capacity to generate profit; - the growth of debt degree within reasonable limits conditioned the positive difference between return on assets and interest rate, showing a major trend of increasing financial performance.

Key words**:** *operational risk, break-even, financial structure, diagnostics, performance.*

INTRODUCTION

The specialized literature discusses the idea that the financial equilibrium of the entity is respected if the profitability compensates the assumed risk, a risk that depends on the economic factors and the financial policy of the enterprise [1; 3; 8; 10; 14].
The diagnostic approach envisages the following forms of operational (or economic) risk, financial risk, and bankruptcy (or insolvency) risk.
Operational risk is the inability of the enterprise to adapt to environmental changes in time and at the lowest possible cost [3]. The results of the enterprise are influenced by several factors, such as: price increases in energy, fuel, natural gas, technical equipment, and technical equipment, increases in wages, which consequently determine the structure of costs and their behaviour in relation to sales volume.
According to [11; 12; 15], the most appropriate method of assessing the economic and financial risk is the break-even method.
The literature reflects important studies on break-even point [5] and its use for establishing the value of a firm [7], for assessing the leverage effect [4], its role in the firm management [6], its role in investing [13], and its level in the small sized-farms dealing with organic farming [2].
In this context, this research aimed to make a comparison analysis concerning the financial structure and stability of two agricultural companies.

MATERIALS AND METHODS

The research was focused basing on the data of agricultural enterprises from the Northern region of the Republic of Moldova. The information sources were Annual financial statements and The cost register.
The distribution of the total amount of constant costs and expenses was carried out on the basis of the volume of sales, using for this purpose the annual statistical survey 21-Sales "Sales of agricultural production".
In the research frame were utilized: break-even method, some traditional methods of economic analysis, such as: comparison, dividening and disintegration, the method of chain substitutions.
In this case was calculated the break-even point and debt degree for two agricultural enterprises

from the northern region: ACP „Taduran Agro" and LLC „Şipca - Spicuşor" in the years 2022-2023.

RESULTS AND DISCUSSIONS

This method is applied both at the product level (in physical units) and at the enterprise level (in value units). In our opinion, the indicators that estimate the break-even point at the enterprise level are: contribution margin, contribution margin rate, revenue from critical sales, safety margin, efficiency gain, result (profit, loss) from operating activity.

The economic content and calculation formulas of these indicators are presented below [17]:

1)*The total contribution margin* (MCt) expresses the excess of sales revenue (VV) over variable costs and expenses (CCV):

$$\mathbf{MC_t = VV - CCV} \quad (1)$$

2)*The contribution margin rate* (R_{MC}) characterizes the share of the total contribution margin in the sales revenue component according to the formula:

$$R_{MC} = \frac{MC_t}{VV} \times 100\% \quad (2)$$

3)*The break-even in value units* reflects the critical size of sales revenue (VVcr) that exactly covers all costs and expenses, with zero profit:

$$VV_{cr} = \frac{CCC}{R_{mc} \div 100} \quad (3)$$

where: CCC – total constant costs and expenditure.

4) *Safety Margin*, also called security index (M_S), reflects the position of sales revenue in relation to break-even and shows by how many value units sales revenue can be reduced without the risk of incurring losses:

$$\mathbf{M_S = VV - VV_{cr}} \quad (4)$$

5) *The efficiency gain* (Se), also referred to as the position (flexibility) indicator, expresses the percentage by which the enterprise can reduce its sales revenue in order to avoid losses and adapt to market requirements. It is calculated according to the formula:

$$S_e = \frac{M_s}{VV} \times 100 \quad (5)$$

The following safety indicator ratings are recommended in the literature [1; 8; 11]:

- if Se<10%, the situation of the enterprise is unstable;
- if Se<20%, the enterprise is relatively stable;
- if Se>20%, the breakeven situation of the enterprise is comfortable.

6)The result (profit, loss) from operating activities (Rop) is the difference between the total contribution margin and total constant costs and expenses:

$$\mathbf{Rop = MC_t - CCC} \quad (6)$$

In the table 1 were calculated these indicators in the dynamics for two agricultural enterprises that differ in their level of economy but also in the structure of costs and expenditures.

The results obtained which are presented in Table 1 show that the sales revenues of the agricultural production cooperative (ACP) "Taduran Agro" exceed those of the LLC "Sipca - Spicuşor" 7.4 times in the reporting year, not taking into account the fact that both entities are producers of cereals and oilseeds, but they have different production capacities. For example, ACP "Taduran Agro" is equipped with state-of-the-art agricultural machinery, while LLC "Şipca-Spicuşor" has outdated and morally obsolete equipment. This factor within the low capacity to pay the bills of LLC 'Şipca-Spicuşor' has made impossible the implementation of innovative cultivation technologies and to obtain higher income.

Also the ratio between variable and constant costs is different. At ACP "Taduran Agro" the share of constant costs and expenses is 76.8%, while at LLC "Şipca-Spicuşor" - 45.4%.

The increased share of constant costs and expenses did not generate a high operational risk, given the fact that in the vicinity of the break-even point the elasticity of the operating result at ACP "Taduran Agro" is low. As a result, sales income outruns the break-even

point in the current year by 32.06%, which means that the enterprise can reduce sales income by 32.06% without the risk to support the losses. At the same time, it is necessary to add the fact that the ACP "Taduran Agro" shows a dynamic increase in the break-even point by MDL 12.9 million or 14.1%. This situation resulted in a negative elasticity coefficient (-0.857), reduction of all profit indicators and profitability ratios, as well as a decrease in the safety margin by 4.12 percentage points.

Table 1. Comparative situation of the two entities performance in relation to break-even point and financial structure

Indicators	ACP „Taduran Agro”		LLC „Șipca - Spicușor”	
	2022	2023	2022	2023
1. Sales revenues, thousand lei	143,471.6	153,763.6	11,326.2	18,318.4
2. Variable costs and expenses, thousand lei	23,188.4	26,185.4	6,090.1	9,067.3
3. Constant costs and expenditure, thousand lei	76,771.4	86,682.9	4,991.4	7,539.4
4. Contribution margin, thousand lei	120,283.2	127,578.2	5,236.1	9,251.1
5. Break-even, thousand lei	91,559.6	104,474.5	10,796.9	14,929.0
6. Result of operational activity, thousand lei	43,521.8	40,895.3	244.7	1,711.7
7. Safety margin:				
- in absolute values, thousand lei	+51,912	+49,289.1	+529.3	+3,389.4
- in relative values, %	+36.18	+32.06	+4.67	+18.5
8. Interest-bearing debts, thousand lei	110,637.0	119,406.5	4,815.0	5,850.5
9. Interest paid, thousand lei	4,571.3	6,287.5	129.6	355.9
10. Average interest rate, %	4.13	5.27	2.69	6.08
11. Profit before tax, thousand lei	42,103.2	38,695.9	2,127.6	3,204.7
12. Net profit for the reporting period, thousand lei	34,819.2	30,921.7	2,088.9	3,000.3
13. Financial leverage ratio, coefficient	1.5161	1.4108	1.8723	2.00
14. Total assets turnover rate, coefficient	0.3375	0.3675	1.031	1.193
15. Return on sales revenue, %	29.35	25.17	18.78	17.49
16. Return on assets, %	9.9	9.25	19.37	20.87
17. Return on equity, %	15.02	13.05	36.27	41.74

Source: Author's calculations based on Annual financial statements, cost registers and annual statistical surveys 21-Sales "Sales of agricultural production" of ACP “Taduran Agro” and LLC “Sipca-Spicușor”

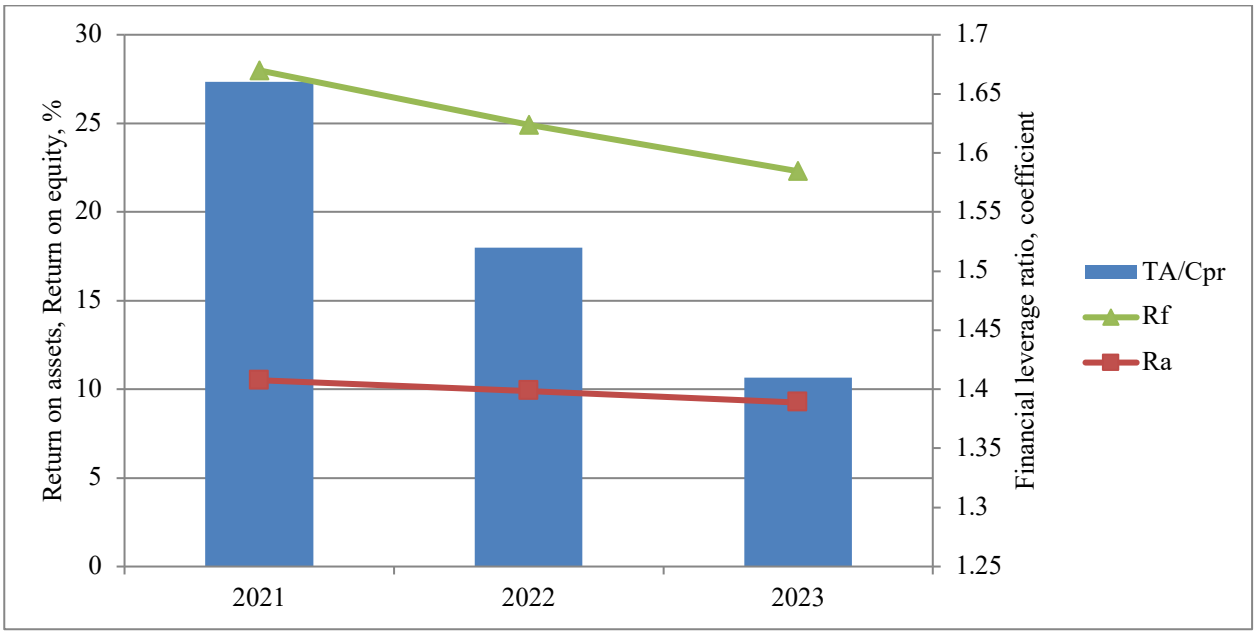
At ACP "Taduran Agro", interest-bearing debts increased by 8.8 million lei or 7.93%. The data presented in Table 1 allow us to note a reduced operational flexibility at LLC "Șipca-Spicușor". This entity is in a much more comfortable situation than PCA "Taduran Agro" in terms of operational risk. Having a lower level of activity with a share of constant costs and expenses of 45.4% LLC "Șipca-Spicușor" has recorded an increase in performance indicators. Thus, the operating profit and net profit increased by 6.0 times and 43.63% respectively. There is also an increase in the safety margin from 4.67% to 18.5%.

The data in Table 1 shows that the increase of the leverage ratio (financial leverage ratio) of LLC "Șipca-Spicușor" by 12.71 percentage points had a positive impact on the increase of the efficiency of the utilization of assets and equity. Thus, the financial profitability increased from 36.27% to 41.74% or by 5.47 percentage points.

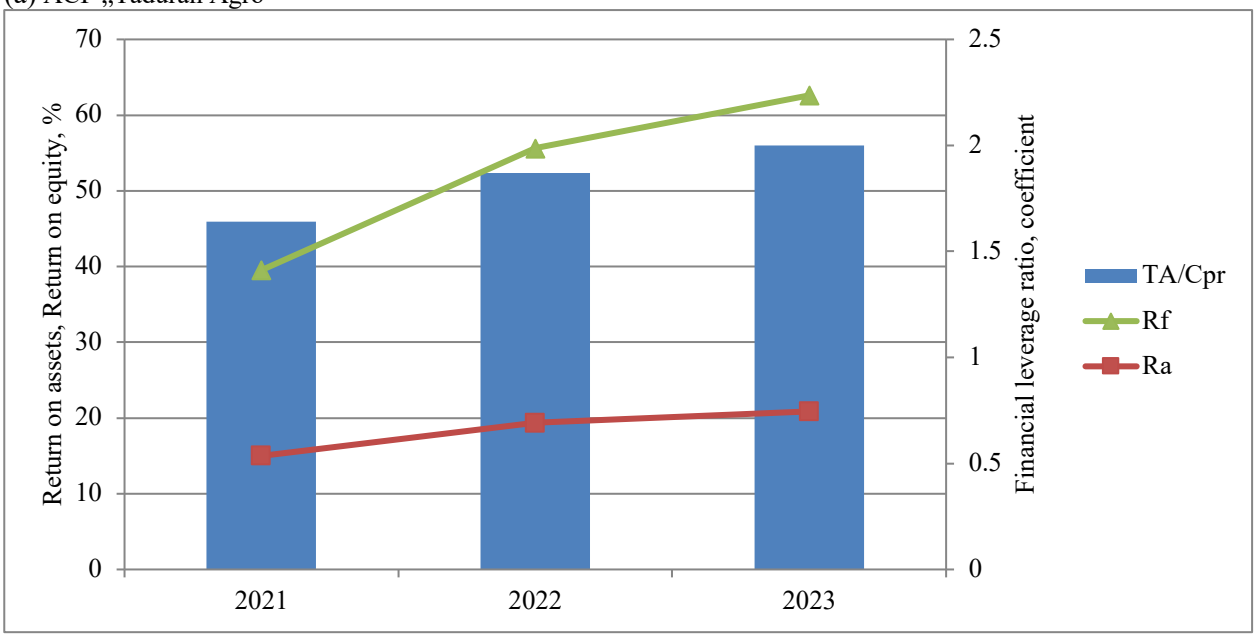
Comparing the evolutionary nature of the rates of return and leverage (financial leverage) of the analyzed entities (Fig. 1), we found contradictory situations. The reduction of the debt ratio in the dynamics of PCA "Taduran Agro" had negative effects that led to the attenuation of the trends of continuous decrease in the rates of return (Fig.1). Thus, in the last year of the analyzed period, the financial leverage decreased by 15.06%, respectively, it is also noted the decrease of return on assets by 1.26 percentage points and financial return by 4.43 percentage points. This situation characterizes the decrease in the capacity of the entity's capital to generate profit. At the same time, at LLC "Șipca-Spicușor", the dynamic increase in the degree of indebtedness had positive effects, showing a trend of a major increase in both the return on assets and the financial return (Fig.1).

This trend is due to the increase in the turnover rate of total assets and equity. At the same time,

the positive effect of leverage occurred against the background of the excess of return on assets over interest rate (Table 1). This means that the increase of indebtedness by 36% in the last year at LLC "Șipca-Spicușor" has created premises for the increase of return on assets and return on equity by 5.87 and 17.21 percentage points respectively, which indicates to the efficient use of the enterprise's patrimony.



(a) ACP „Taduran Agro"



b) LLC „Șipca-Spicușor"

Fig. 1. The correlations between return on equity, return on assets and leverage (financial leverage ratio) in grain and oilseed producing entities

Source: Author's calculations based on Annual financial statements, cost registers and annual statistical surveys 21-Sales "Sales of agricultural production" of ACP "Taduran Agro" and LLC "Sipca-Spicușor"

In this context, it is necessary to quantify the factors and their quantitative influence on the change in financial profitability. It is well known that financial profitability expresses the ratio between net profit or profit before tax and the average value of equity, according to the formula:

$$R_{cpr} = \frac{Pn\ sau\ Pimp}{\overline{Cpr}} \times 100\% \quad (7)$$

To decompose the factor model, first of all we multiply the numerator and denominator of formula 7 by the average value of assets:

$$R_{Cpr} = \frac{Pimp}{\overline{Cpr}} \times \frac{\overline{A}}{\overline{A}} = \frac{Pimp}{\overline{A}} \times \frac{\overline{A}}{\overline{Cpr}} \quad (8)$$

According to this factor model, return on equity changes under the influence of the following factors:

-economic profitability ($\frac{Pimp}{\overline{A}}$);

-the debt degree or leverage ($\frac{\overline{A}}{\overline{Cpr}}$).

In the theoretical mode, the influence of these factors is calculated:

8.1. $\Delta R_{Cpr}^{\frac{Pimp}{\overline{A}}} = \Delta \frac{Pimp}{\overline{A}} \times \frac{\overline{A}}{\overline{Cpr}}(0)$.....(9)

8.2. $\Delta R_{Cpr}^{\frac{\overline{A}}{\overline{Cpr}}} = \frac{Pimp}{\overline{A}}(1) \times \Delta \frac{\overline{A}}{\overline{Cpr}}$ .....(10)

The second stage of the diagnosis breaks down the return on assets by influencing factors which can be seen in the Figure 2.

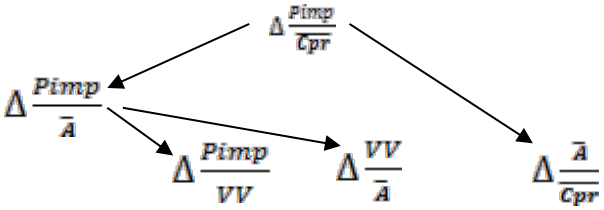


Fig. 2. Return on equity decomposition scheme
Source: Elaborated by the author.

Figure 2 shows the factorial model of the financial rate of return.

$R_{Cpr} = \frac{Pimp}{VV} \times \frac{VV}{\overline{A}} \times \frac{\overline{A}}{\overline{Cpr}}$ factorial model II .....(11)

According to factor model II, the factors influencing the change in financial profitability are:

- return on sales (Pimp/VV);
- asset turnover rate (VV/A);
- leverage (A/Cpr).

Thus, factor model II expresses the dependence of financial profitability on business efficiency, asset utilization and financial structure of the entity.

Table 2 presents the calculation of the influence of factors according to factor model II, applying the chain substitution method.

From the calculations in Table 2 we deduce the following:

1) the increase in financial profitability at LLC "Șipca-Spicușor" is due to the positive influence of the following factors:

- the increment of the asset rotations number from 1.031 to 1.193 points led to the growth of financial rate by 5.31 percentage points, this being the decisive factor;
- the increase in the entity's leverage ratio from 187.23% to 200% conditioned the increase in financial profitability by 2.67 percentage points.

2) A negative influence was exerted by the decrease in the return on sales from 18.78% to 17.49%, which caused a decrement in the financial profitability by 2.51 p.p. This value is considered as own reserve for the enterprise.

Concerning to the factor A/Cpr, it deserves to mention that the growth in the financial structure does not always lead to an increase in return on equity. In economic practice, there is a maximum limit for leverage. The ratio of total debt to total sources must not exceed 70%. Exceeding this limit entails higher interest rates for the entity and additional guarantees required by the banks, because the financial risk is higher (in such a situation the multiplication factor (A/Cpr) cannot exceed 1+70/30=3.33 units). This means that debt-raising must be done with caution, as the return on assets must exceed the interest rate.

At LLC "Șipca-Spicușor" according to the data in Table 1 the return on assets exceeds the interest rate in both periods.

Thus, in the year of management, this excess is 14.79 p.p., a situation that favoured the excess of the financial return over the economic return (Rf>Ra) by 2 times.

In this context, the fundamental issue addressed by the authors [9; 10; 14, 16] is to determine whether unfavourable economic conditions can influence the decrease in economic profitability and financial profitability, so as to cause the correlation (Rf<Ra) based on the following clarifications:

- in the case of stable or growing economic conditions, leverage is less dangerous and can be utilized at high levels if the difference between economic return and interest rate is stimulating such that Rf is higher than Ra;

- if there is economic instability, there is a high risk that business activity will decline, leading to a situation where leverage becomes dangerous, causing the correlation to exist Rf < Ra.

Table 2. Calculation of the influence of factors on changes in financial profitability in LLC "Șipca-Spicușor"

No.	No.	Correlated factors			$R_f = \frac{Pimp}{Cpr} \times 100$	Calculation of the influence of factors	The results	Causes of deviation
		Pimp/VV	VV/A	A/Cpr				
1	0	18.78	1.031	1.8723	36.27	-	-	-
2	1	**17.49**	1.031	1.8723	33.76	33.76 – 36.27	-2.51	↓ Pimp/VV
3	2	17.49	**1.193**	1.8723	39.07	39.07 – 33.76	+5.31	↑ VV/A
4	3	17.49	1.193	**2.00**	41.74	41.74 – 39.07	+2.67	↑ A/Cpr
Total		X	X	**X**	X	X	+5.47	X

Source: Author's calculations based on the data from Table 1.
Verification: 41.74 – 36.27 = 5.47 p.p.

CONCLUSIONS

The results of our investigations show that the relatively large share of constant costs and expenses (76.8%) did not generate a high operational risk in the ACP enterprise "Taduran Agro", given the fact that in the vicinity of the break-even point the elasticity of the operating result is low. The negative value of the elasticity coefficient (-0.857) shows that the operating result of this entity is very sensitive to the change in sales revenues, registering a decrease of 2.6 million lei. At the same time, LLC "Șipca-Spicușor" has a lower operational risk, which is confirmed by the positive elasticity coefficient (9.716), the relatively low share of constant costs and expenses (45.4%), which consequently registers an increase in all performance indicators.

The factorial diagnosis revealed that the factors influencing the increase in financial profitability are:

-Increasing asset turnover by 15.7%;

-Increase in the entity's leverage ratio by 6.82%.

The positive influence of the indebtedness ratio was manifested against the background of exceeding the return on assets compared to the average interest rate by 14.79 percentage points, also confirming the existence of correlation Rf>Ra.

3. Improving financial performance and reducing operational risk require an increase in return on sales, which can contribute to an increase in return on assets by 1.33 percentage points and financial return by 2.51 percentage points based on the improvement of the assortment structure to meet consumer requirements and the penetration of the entity's products on new markets.

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