

Analysis and evaluation of the risk of non-competitiveness

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Abstract. The risk of non-competitiveness is a problem that companies face because anticipating changes can improve their market position. The characteristics of the branch often determine particularities at the level of technology evolution, and later, through the appropriate combination of factors, sources, and the effect of progressive changes of technology, there are possibilities to improve the company's position on the market. The research carried out allowed us to determine an analysis of the risk of non-competitiveness through the evolution of indicators that measure this risk compared to the main competitor and the market average.

1. Introduction

Increasingly frequent changes in inefficient products, services or processes often lead to disruptions in production that are explained in the context of the rapid development of technology and innovation by lack of anticipation [1]. Thus, companies face the need to make decisions that will improve their competitive advantage, financial performance, and sustainable production [2].

Other experts consider technology to be a "basic product" that offers uniqueness, to which SMEs have access and can use it to maintain their competitiveness [3 - 5]. Although the financial limitation is known to SMEs, the need to compete differently, to take advantage of technological changes is increasingly important in the context of competition, when differences in infrastructure produce advantages in almost all industries [6, 1].

The multitude of variables proven in empirical studies, such as: financial and capacity constraints [7, 8], market fluctuation [9], as well as rapid changes in technologies [10], make SMEs face decisions that sometimes they are difficult to manage.

The study starts from the need to study the risk of non-compete at the level of a production company through its own results compared to the results of the main competitor and the market average, over a period of five years, to see if the risk of reduction profitability, affects or not the competitiveness in the existing conditions on the market.

2. Material and method

In this study, an analysis was made of the risk of competitiveness in relation to the decision to reduce the selling price of finished products. The following initial data were used, according to Table 1.

Table 1. The situation of the elements of income and expenses

No.	Indicators / Years	Unit	2017	2018	2019	2020	2021
1	Sales income	thousand RON	13,110	13,320	13,320	14,350	14,875
2	Sales expenses	thousand	3,950	3,950	4,200	4,560	4,700

3	- variable expenses	RON thousand RON	2,650	2,700	2,950	3,310	3,550
4	- fixed expenses	thousand RON	1,300	1,250	1,250	1,250	1,150
5	Average rate of return on the branch	%	2.16	2.15	2.13	2.14	2.14
6	Profit rate from the main competitor	%	2.16	2.17	2.18	2.19	2.20
7	The average selling price of the product	thousand RON	3.80	3.70	3.60	3.50	3.45

For this, the optimal level of the expected expenses related to sales (ChV) for 2022 was calculated, starting from the calculation ratio of the profit rate (Rp), according to equation (1).

$$R_p = \frac{P_b}{ChV} \quad (1)$$

The value of the rate of profit (Rp) equal to the average rate existing on the branch was used, and the gross profit (Pb) equal to that of the previous year. The volume of forecast sales (VVp) was calculated by summing the gross profit with the forecast sales expenses, according to equation (2).

$$VV_p = P_b + ChV \quad (2)$$

Then the conditional level of variable expenses (CVcon) was calculated as the difference between the forecast sales expenses (ChV) and the fixed expenses (CF), according to equation (3).

$$CV_{con} = ChV - CF \quad (3)$$

The coefficient of the share of variable expenses in the sales volume (v) was calculated as the ratio between the variable expenses (CV) and the sales volume (VV), according to equation (4).

$$v = \frac{CV}{VV} \quad (4)$$

Using the coefficient calculated in equation 4, the forecasted variable expenses (CVp) were calculated by multiplying the sales volume forecasted by this coefficient, according to equation (5).

$$CV_p = VV_p \times v \quad (5)$$

To be able to calculate the reserve related to the forecasted consumption, the difference was made between the conditioned variable expenses (Cvcon) and the forecasted variable expenses (CVp), according to equation (6). This reserve allows us to see the value that results at the enterprise level because of adjusting the rate of profit to the average level in the industry.

$$R = CV_{con} - CV_p \quad (6)$$

According to this reserve, the company has the possibility to opt for the increase of the unit production costs because of the quality improvement or the reduction of the sales price as a result of the increase of the sales volume. The allowable size of the reserve can be calculated if we know the expected quantity (Qp). The forecasted quantity can be obtained as a ratio between the forecasted sales volume (VVp) and the average sales price registered in the previous year (pvm), according to equation (7).

$$Q_p = \frac{VV_p}{p_{vm}} \quad (7)$$

The allowable reserve for the reduction of the selling price (Rpv) is determined as the ratio between the reserve related to the forecasted consumption (R) and the forecasted quantity (Qp), according to equation (8).

$$R_{pv} = \frac{R}{Q_p} \quad (8)$$

The forecast selling price (PPP) helps us to include all the variables studied, according to equation (9).

$$p_{pv} = p_{vm} - R_{pv} \quad (9)$$

Then the evolution of the indicators was followed in dynamics: gross profit, sales income, sales expenses, net profit and comparisons were made between these indicators according to the following correlations: $IPB > IVV > ICV$ and $IPN > IVV > ICV$.

Subsequently, the risk of reducing the profitability of production was calculated by means of the indicators gross profit and net profit. Because the profitability of the production represents an efficiency indicator that shows the capacity of the enterprise to generate profit from the current activity, several indicators have been calculated that measure the risk, such as:

- The risk of reducing the profitability of sales revenues, according to equation (10).

$$K_{RPB} = \frac{P_b}{VV} \quad (10)$$

- The risk of reducing the profitability of sales revenue, calculated through net profit, according to equation (11).

$$K_{RPB} = \frac{P_n}{VV} \quad (11)$$

3. Results and discussion

Using the initial data and the related formulas, a series of indicators was calculated, according to Table 2, which shows the related situation for the studied enterprise.

Table 2. The situation of the evolution of the indicators related to the current and forecasted production

No.	Indicators / Years	Unit	2017	2018	2019	2020	2021
1	Gross operating profit	thousand RON	9,160.00	9,370.00	9,120.00	9,790.00	10,175.00
2	Net operating profit	thousand RON	7,694.40	7,870.80	7,660.80	8,223.60	8,547.00
3	Profit rate	%	2.32	2.37	2.17	2.15	2.16
4	Sales expenses (on average per branch)	thousand RON	4,240.74	4,358.14	4,281.69	4,574.77	4,754.67
5	Expected sales volume	thousand RON	13,400.74	13,728.14	13,401.69	14,364.77	14,929.67
6	Conditional variable expenses	thousand RON	2,940.74	3,108.14	3,031.69	3,324.77	3,604.67
7	The coefficient of the share of variable expenses in the sales volume	%	0.20	0.20	0.22	0.23	0.24
8	Expected variable expenses	thousand RON	2,708.77	2,782.73	2,968.09	3,313.41	3,563.05
9	Reserve for projected consumption	thousand RON	231.97	325.41	63.60	11.36	41.62
10	Expected quantity	thousand pcs	3,526.51	3,710.31	3,722.69	4,104.22	4,327.44
11	Admissible reserve for the reduction of the sale price	%	0.07	0.09	0.02	0.00	0.01
12	Expected sale price	%	3.73	3.61	3.58	3.50	3.44

From the analysis of Table 2 it is observed that the gross profit from exploitation registered an increase during the 5 years studied, a situation also encountered at the level of the net profit as a result of the stability of the profit tax percentage of 16%.

The profit rate registered the highest value in 2018, this gradually decreasing until 2021 when it reached the value of 2.16.

Calculating the indicator "Expenditure related to sales (based on average per branch)", by reporting the gross profit from operation at the average rate of profit per branch, it is found that it registers values higher than the existing situation in the enterprise. Lower is an advantage for the enterprise. Their increase is determined by the increase in production volume, which is also reflected in the sales revenue indicator.

The sales volume at the forecasted level is also indirectly influenced by the average rate of profit per branch, this being at a higher level than the real one obtained by the company.

Conditional variable expenses, obtained as the difference between expenses related to sales (by average per branch) and initial fixed expenses, decrease over the years from 111% (2017) to 102% (2021).

The coefficient of the share of variable expenses in the sales volume registers an increase of 4% in 2021 compared to 2017, because of changes in both direct and indirect costs (raw materials and materials, administration salaries ...), but also due to the increase in physical volume of production.

The forecasted variable expenditures register an ascending evolution, these having the highest value in 2021, the increase being of 132%.

The reserve related to the forecasted consumptions, obtained as the difference between Conditional variable expenses and forecasted variable expenses do not allow us to see if in this situation where we do not use the profit rate adjustment, we have the possibility to bear any price increases or not. In the present situation, according to Table 2, the largest reserve exists in 2018 and in 2021 the value has improved compared to 2020, reaching 41.62 thousand lei.

The forecasted quantity is observed to have an upward evolution, which does not make us say that even in the conditions of increasing variable expenses we are efficient, and we can respond to existing requests with a higher volume of products.

To be able to analyze the possibility of reducing the selling price because of possible changes in market conditions, the indicator Permissible reserve for reducing the selling price was calculated, which gradually decreased over time, reaching 2021. at the value of 0.01 thousand lei.

The forecast sale price is observed to have suffered a gradual reduction of 8%, from 2017 to 2021.

According to Table 2, in which we wanted to see if the company is in a situation of non-competitiveness or not, we can say that the company is not in a situation of non-competitiveness because the profit rate is higher than the average per branch in all years studied and price reduction is possible due to the existing reserve. Compared to the main competitor, we have a profit rate lower by 2%, in 2021, because of some expansion actions that the main competitor has started since 2019, when its profit rate exceeded our profit rate, because of better internal conditions.

Table 3 shows the evolution of the indices related to gross profit, net, sales income, and sales expenses.

Table 3. The situation of the evolution of the indices

No.	Index names	Symbol	2018/2017	2019/2018	2020/2019	2021/2020
1	Gross profit index	I_{PB}	1.02	0.97	1.07	1.04
2	Sales revenue index	I_{VV}	1.02	1.00	1.08	1.04
3	Index of sales expenses	I_{CV}	1.00	1.06	1.09	1.03
4	Net profit index	I_{PN}	1.02	0.97	1.07	1.04

From the analysis of Table 3 in 2020 compared to 2019 the evolution is the best in all indices, followed by 2021 compared to 2020.

To be able to see the more significant differences at the level of the calculated indices, the correlation relations presented in Table 4 were used.

Table 4. The situation of the differences resulting from the correlations of the indices

No.	Correlation relations	2018/2017	2019/2018	2020/2019	2021/2020
1	$I_{PB} > I_{VV}$	0.01	-0.03	0.00	0.00

2	$I_{VV} > I_{CV}$	0.02	-0.06	-0.01	0.01
3	$I_{PB} > I_{CV}$	0.02	-0.09	-0.01	0.01
4	$I_{PN} > I_{VV}$	0.01	-0.03	0.00	0.00
5	$I_{VV} > I_{CV}$	0.02	-0.06	-0.01	0.01
6	$I_{PN} > I_{CV}$	0.02	-0.09	-0.01	0.01

From the analysis of Table 4, in 2018 compared to 2017, the correlations to all calculated indices are observed and in 2021 compared to 2020. Although from Table 4 we showed a good evolution of 2020 compared to 2019 from the analysis obtained in Table 4 shows that IVV is lower than ICV resulting in a negative difference, as well as the correlations in points 3, 5-6.

Table 5 calculated the evolution of the risk reduction indicators.

Table 5. The situation of the evolution of the indicators of risk reduction of profitability

No.	Indicators/Years	2017	2018	2019	2020	2021
1	The risk of reducing the profitability of sales revenue, calculated through gross profit	0.70	0.70	0.68	0.68	0.68
2	The risk of reducing the profitability of sales revenue, calculated through net profit	0.59	0.59	0.58	0.57	0.57

The analysis of Table 5 shows that the risk of reduced profitability exists for both indicators due to the existence of a downward evolution.

If we correlate the results from Table 5 with those from Table 2, this is also highlighted by the decrease of the profit rate by 7% (2021% compared to 2017).

4. Conclusions

The analysis found that the company is competitive on the market, which is a rate of profit above average on the market. However, because it has decreased significantly since 2019, a closer analysis of sales expenditures, which have grown at a faster rate than the increase in sales revenues, is required. The obtained results tell us that the company has some less efficient production conditions compared to the main competitor.

From the analysis of the correlation of the indices, the company made efforts to recover in 2021 compared to 2020, reaching differences to be positive, thus resulting in progress.

The analysis of the risk of reducing the profitability of sales revenues also shows that the profitability decreased from 2017 to 2021, this risk remaining at a stable level in the last two years.

References

- [1] Lee CY, Park HJ and Park YT 2013 *Tech Anal & Strat Manag* **25** (5).
- [2] Mizik N and Jacobson R 2003 *J of Mark* **27** (1).
- [3] Bannister F and Remenyi D 2005 *Elec J Inf Syst Eval* **8** (13).
- [4] Bhatt GD and Grover V 2005 *J of Manag Inf Syst Eval* **22** (2).
- [5] Brown SA Venkatesh V and Goyal S 2012 *Inf Syst Res* **23** (12).
- [6] Joseph NPS, Choo PY, Wong SW, Phan KY and Lim EH 2012 *J of Emerg Trends in Comp & Inf Sci* **3** (1).
- [7] Bolton P, Wang N and Yang J 2019 *J of Econ Th* **184**.
- [8] Reinartz SJ and Schmid T 2016 *The Rev of Finan Stud* **29** (6).
- [9] Fuss C and Vermeulen P 2008 *App Econ* **40** (18).
- [10] Kang W, Lee K and Ratti RA 2014 *J of Macroec* **39**.