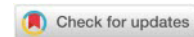


# A METHODOLOGY FOR ANALYSIS OF PRODUCTION NET SALES REVENUE WITH REGARD TO THE SALES PROFITABILITY AND THE ENTERPRISE'S LEVEL OF BUSINESS RISK

Rositsa Ivanova<sup>1\*</sup>

<sup>1</sup>UNWE – Sofia, Republic of Bulgaria, e-mail: [Rosi.Ivanova@abv.bg](mailto:Rosi.Ivanova@abv.bg)



**Abstract:** This publication highlights the methodology for analysis of production net sales revenue. It consistently presents an analysis of the deviation of production net sales revenue for the current period versus the previous period. This deviation is subject to the influence of three direct factors:

- 1) Changes in the natural volume of sold products.
- 2) Changes in the product range structure of sold products.
- 3) Changes in the net sales price of products.

The impact of these direct factors may be established both in absolute and in relative terms. For this purpose, the author uses different elements of the method of the financial and business analysis: methods of comparison, adjustment of indicators, subsequent substitution, index method, etc.

Analysis is made for the dynamics of production net sales revenue for more years in a row, by identifying both their average dynamics and the variation for the whole period of time. To this end, the author has used the dispersion analysis.

The object of this article refers to the production net sales revenue with regard to the sales profitability and the enterprise's level of business risk. The object of study is explained through the methodology for analysis, which is the subject matter of the study presented in the article.

The author's objective is to suggest improved methodology for analysis of production net sales revenue, profitability of sales and level of business risk for the enterprise. The author presents her vision being well aware that the methodology for analysis of production net sales revenue with regard to their effectiveness (sales profitability) and the level of business risk may be successfully used in the business practice for the management of enterprises and their business both in operating and in strategic aspect.

In order to achieve the objective of the study, the following research tasks have been defined:

- 1) To carry out analysis of the dynamics of production net sales revenue for the analysed time period.
- 2) To analyse the average annual dynamics of production net sales revenue for the analysed period of 4 years.
- 3) To carry out analysis of the variation of production net sales revenue.
- 4) To analyse the sales profitability.

Keywords: net sales revenue, analysis, dynamics, variation, profitability, business risk

Field: Social Studies

## 1. INTRODUCTION

The issue of production net sales revenue is relevant at all phases and stages of the industrial enterprises' development. Nowadays, the relevance of this issue becomes even greater due to the following major reasons:

1) In the conditions of the Covid-19 pandemic that outburst at the beginning of 2020 and continued throughout 2021 until the mid-2022, many enterprises in Bulgaria were exposed to a number of types of risks. The resulting health crisis directly affected the national economy and caused deterioration of the financial and economic indicators that characterise the financial performance, the financial position and the financial stability of the Bulgarian enterprises. The Bulgarian government had undertaken numerous measures to overcome the consequences of the health crisis and the other crises resulting from it. These measures may be classified in two areas: 1) measures for continuing enterprise's business; and 2) measures for keeping jobs. In this crisis context, many enterprises have suffered and are still suffering numerous difficulties while carrying out their business, due to the closure or restriction of many businesses, disturbed supply chain, continuous raising of prices of raw materials, supplies, fuels and energy sources.

2) At the beginning of 2022, some other crisis factors occurred, such as the war between Russia and

\*Corresponding author: [Rosi.Ivanova@abv.bg](mailto:Rosi.Ivanova@abv.bg)



Ukraine in the vicinity of the national frontiers, as well as the sanction of the European Union undertaken against Russia, which Bulgaria must observe. These objective circumstances caused severe damages to the various industries and their related sectors of the national economy, comprising significant raises in the prices of gas, electricity and heating energy, which led to the increase of enterprises' production costs for raw materials and supplies required for the manufacturing of finished products. At the same time, the markets' shrinkage, the enterprises' impaired financial position and the difficulties to settle their liabilities led to decrease of production net sales revenue and deterioration of their liquidity.

3) The high inflation rate in Bulgaria has adverse impact on the enterprises' business and the economy of the country.

4) The political instability in the country, the lack of regular government and working legislative body (Parliament) on long-term basis also has had negative impact on the development of the enterprises as major units of the national economy.

In such crisis context, the issues of production net sales revenue, business efficiency and level of business risks for the enterprises, the methods for their analysis and the forecasts of their future development are crucial.

The results from the analysis of production net sales revenue related to sales profitability and level of business risk for the enterprise are useful for the management of the enterprises, in particular, for their anti-crisis management under the conditions of different types of crisis with parallel effect: economic, financial, inflation, energy, pricing, political, etc.

## 2. METHODOLOGY FOR ANALYSIS OF PRODUCTION NET SALES REVENUE

The methodology for analysis of production net sales revenue is illustrated with the help of business data of an enterprise operating in the wood industry in Bulgaria dealing with manufacturing of veneer and wood plates. For the purposes of this publication, the enterprise is called Bulgarski Furnir AD.

### 2.1. INPUT DATA FOR THE ANALYSIS

The analysis of production net sales revenue is based on data created by the enterprise's accounting system. This information is contained in the credit turnover of synthetic account "Production sales revenue" in group "Sales revenue and other revenue from principal activity". Diverse analytical accounting can be recorded under this account, depending on the enterprise's management's needs of information, e.g. by customers, by types of products, by product groups, by markets, etc. Such information is necessary for the internal analysis of production net sales revenue to establish the direct factors' impact on their dynamics. The information from the financial statements, in particular, the statement of income and expenses (income statement) of the enterprise, may be used for the purposes of the internal analysis of the production net sales revenue.

### 2.2. ANALYSIS OF THE DYNAMICS OF PRODUCTION NET SALES REVENUE

The business data of Bulgarski Furnir AD for the period 2019 – 2022 required for the analysis of the production net sales revenue are presented in table 1.

Table 1. Dynamics of net revenue from product sales

Indicators	Years			
	2019	2020	2021	2022
1. Net revenue from product sales, BGN thousand	25709	16894	12773	16548
2. Annual absolute increase (+) or reduction (-), thousand BGN	-	-8815	-4121	3775
3. Percentage of dynamics by years, %	-	65,71	75,61	129,55
4. Relative dynamics by years	-	0,6571	0,7561	1,2955
5. Rate of increase (+) or decrease (-)	-	-0,3429	-0,2439	0,2955

According to the data in table 1, we can determine the values of indicators characterizing the dynamics of production net sales revenue. These indicators are:

annual absolute increase or decrease (+,-Δ NR):

$$+,-\Delta NR = NR_n - NR_{n-1}, \text{ where:}$$

$NR_n$  are production net sales revenue for the relevant year, and  
 $NR_{n-1}$  – are the production net sales revenue for the previous year.

- dynamics rate by years (NR%):  
 $NR\% = NR_n / NR_{n-1} \times 100$

- relative dynamics by year (NR):  
 $NR = NR_n / NR_{n-1}$

- increase or decrease rate ( $T_{+,-}^{NR}$ ):

$$T_{+,-}^{NR} = NR - 1 = \frac{NR_n}{NR_{n-1}} - 1$$

The increase or decrease rate may be calculated according to the following formula:

$$T_{+,-}^{NR} = \frac{+,-NR}{NR_0}, \text{ where:}$$

$NR_0$  are the production net sales revenue for the first year of the analysed period (reference year).

Data in table 1 show that at the end (2022) versus the start of the period (2019) subject to analysis, the production net sales revenue has decreased by BGN 9161 thousand (16548 – 25709), which is a relative decrease by 0,6437 (16548:25709), and the decrease rate is equal to 64,37 % [(16548:25709) x 100].

The decrease rate is 35,63 [(16548:25709) – 1] or (-9161:25709). This decrease for the entire period is due to the dynamics of the production net sales revenue by years, as follows:

for 2020 versus 2019, production net sales revenue has decreased by BGN 8815 thousand (16894 - 25709), which means relative dynamics of 0,6571 (16894:25709), dynamics rate of 65,71 % [(16894:25709) x 100] and decrease rate of 0,3429 [(16894:25709) - 1]. The decrease of production net sales revenue is due to the health crisis caused by the Covid-19 pandemic.

for 2021 versus 2020, the decrease of production net sales revenue has shrunk and is in the amount of BGN 4121 thousand (12773 – 16894), which means dynamics rate of 75,61 % [(12773:16894) x 100], relative dynamics of 0,7561 and another relative decrease of 0,2439 [(12773:16894) – 1].

for 2022 versus 2021, the production net sales revenue has increased by BGN 3775 thousand (16548 – 12773), which means dynamics rate of 129,55 % [(16548:12773) x 100], or relative increase of 0,2955 [(16548:12773) – 1].

The total decrease of production net sales revenue for the entire period in question is in the amount of BGN 9161 thousand [(-8815) + (-4121) + (+3775)], i.e. as much as their decrease for 2022 versus 2019 is.

The dynamics of production net sales revenue by years may be seen on chart 1.

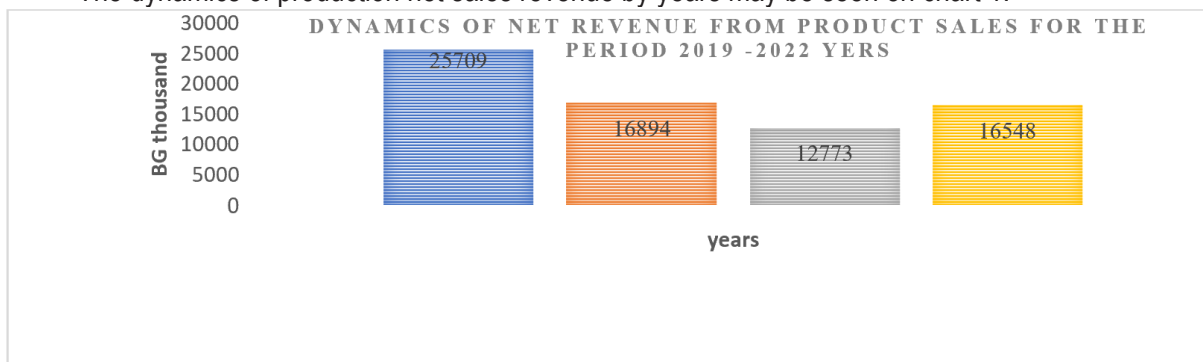


Chart 1

### 2.3. ANALYSIS OF THE AVERAGE ANNUAL DYNAMICS RATE OF PRODUCTION NET SALES REVENUE

The indicator “Average rate of dynamics” for the period may be used to describe the dynamics of production net sales revenue for a series of subsequent periods (for example, years). The following geometric value is used to calculate it with the help of the following formula:

$$\bar{Y}_g^{np} = \sqrt[n-1]{\prod X_i} \text{ where:}$$

$\bar{Y}_g^{np}$  is the average annual dynamics rate of production net sales revenue;  
 $\prod X_i$  – the relations of production net sales revenue for the relevant year versus the previous year (relative dynamics by years), and  
 n – number of years during the analyzed period, including the reference year (the first year of the analyzed period of time).

According to the data in table 1, the average rate of dynamics of production net sales revenue is calculated for the period 2019 – 2022, 2019 being the reference year:

$$\bar{Y}_g^{np} = \sqrt[3]{0,6571 \times 0,7561 \times 1,2955} = \sqrt[3]{0,6437} = 0,8634$$

The average annual dynamics rate of production net sales revenue is equal to 0,8634.

In order to calculate the average annual dynamics rate of the indicator, we may use the following formula:

$$\bar{Y}_g^{np} = \sqrt[n-1]{\frac{NP_n}{NP_0}}$$

$NP_n$  are the production net sales revenue for the last year;

$NP_0$  – the production net sales revenue for the first year (reference year). In this particular case:

$$\bar{Y}_g^{np} = \sqrt[3]{\frac{16548}{25709}} = \sqrt[3]{0,6437} = 0,8634$$

The percentage of the average annual dynamics rate of the production net sales revenue is 86,34 % (0,8634 x 100), which shows a relative instability of the indicator's values.

#### 2.4. ANALYSIS OF THE VARIATION OF PRODUCTION NET SALES REVENUE

The change of production net sales revenue for each year versus the previous year of the analysed period is different. This requires to calculate the variation of production net sales revenue for the entire period. For this purpose, we can calculate the variation coefficient, which characterises the deviation (dispersion) of production net sales revenue around the average production net sales revenue for the entire period subject to analysis. The variation coefficient ( $V_g$ ) can be calculated with the following formula:

$$V_g = \frac{\sigma_q}{\bar{q}}, \text{ където:}$$

$\sigma_q$  is the standard deviation of the indicator in question;

$\bar{q}$  - the average amount of production net sales revenue for the entire period.

The standard deviation is calculated with the formula:

$$\sigma_q = \sqrt{\frac{\sum (q_i - \bar{q})^2}{n}}, \text{ where:}$$

$q_i$  are the actual production net sales revenue by years during the analysed period;

n – the number of years during the same period.

The average amount of production net sales revenue is calculated with the following formula:

$$\bar{q} = \frac{\sum q}{n}$$

For the purposes of the analysis, table 2 is compiled based on the data in table 1.

Table 2. Variation of net revenue from product sales

Years	Net revenue from product sales, BGN thousand	Average net revenue from product sales for the period, BGN thousand.	Deviations	Квадрат на отклоненията
	( $q_i$ )	( $\bar{q}$ )	( $q_i - \bar{q}$ )	( $q_i - \bar{q}$ ) <sup>2</sup>
2019	25709	17981	7728	59721984
2020	16894	17981	-1087	1181569
2021	12773	17981	-5208	27123264
2022	16548	17981	-1433	2053489
All	71924	17981	0	90080306

The following are calculated with the help of the data in table 2:

- the average amount of production net sales revenue:

$$\bar{q} = \frac{\sum q}{n} = \frac{71924}{4} = 17981 \text{ BGN thousand}$$

- standard deviation:

$$\sigma_q = \sqrt{\frac{\sum (q_i - \bar{q})^2}{n}} = \sqrt{\frac{90080306}{4}} = \sqrt{22520076,5} = 4745,23 \text{ BGN thousand}$$

- variation coefficient:

$$V_g = \frac{\sigma_q}{\bar{q}} = \frac{4745,23}{17981} = 0,2639$$

- variation percentage:

$$V\% = V_g \times 100 = 0,2639 \times 100 = 26,39 \%$$

- uniformity coefficient of production net sales revenue ( $K_r$ ):

$$K_r = 1 - V_g = 1 - 0,2639 = 0,7361$$

These calculations show that the deviation (dispersion) of the actual production net sales revenue from the average production net sales revenue for the period 2019 – 2022 is 26,39 %. Such deviation is presented on chart 2.

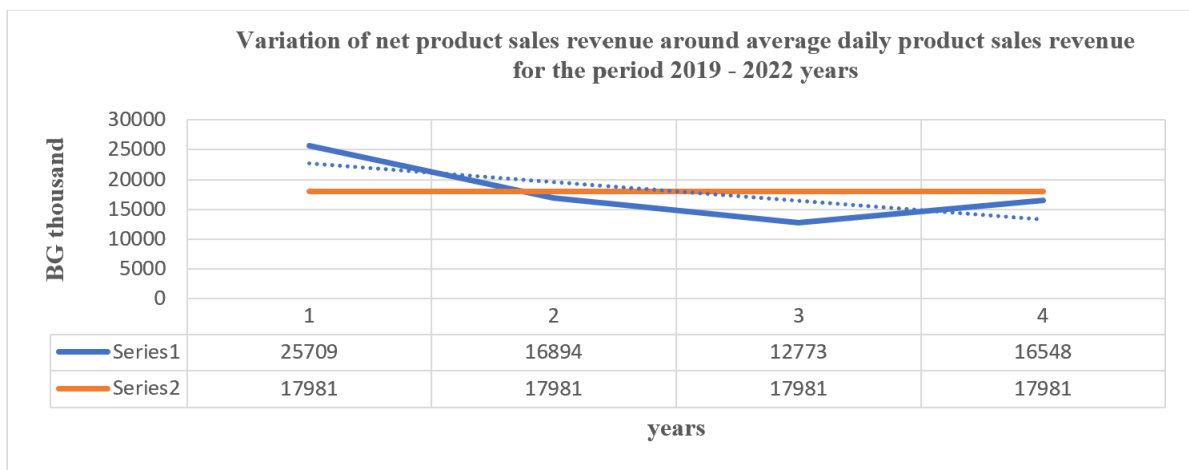


Chart 2

During the period 2019 – 2022, Bulgarski Furnir AD is characterised with high degree of variation of production net sales revenue (26,39 %), i.e. such revenue is relatively unstable, which is to a great extent due to the consequences of the Covid-19 pandemic.

We assume that the variation coefficient is an element of a system of indicators for analysis of the level of business risk for the enterprise. The higher the coefficient, and the variation percentage, respectively, the bigger the uncertainty for the production net sales revenue is.

For the purposes of the analysis and assessment of the business risk for the enterprise, we need to compare the values of coefficients, percentages of variation, respectively, of production net sales revenue and of the production sales gains. The bigger this difference is, the higher the level of business risk for the enterprise.

The logic is to make the analysis for a period of 10 years, and most commonly it is made for a period of 5 years. This methodology may be used for comparative analysis of the dynamics of production net sales revenue of enterprises with similar business and of competitive enterprises or leaning enterprises in the relevant sector of the national economy.

In case of high inflation, there is a need to adjust the values of the relevant indicator – the production net sales revenue in this particular case. For this purpose, we need additional information for the consumer price index for the analysed period, which measures the aggregate inflation rate in the country.

### 3. ANALYSIS OF THE PROFITABILITY OF SALES

For the purposes of the analysis, table 3 is compiled on the bases of the data in table 1.

The data in table 3 shows that the profitability of sales for 2020 versus 2019 and for 2021 versus 2020 as decreased, and for 2022 versus 2021, it has increased.

Table 3. Profitability of sales

Indicators	Years			
	2019	2020	2021	2022
1. Net revenue from product sales, BGN thousand	25709	16894	12773	16548
2. Profit from product sales, BGN thousand	951	517	138	232
3. Profitability of sales, % (item 2 : item 1) x 100	3,6991	3,0603	1,0804	1,4020

### 4. CONCLUSION

The results from the study allows us to conclude that the analysis of the production net sales revenue, the profitability of sales and the level of business risk for the enterprise is important for the management of its business upon making decisions related to its choice of product structure, customers, market niches and investments. Based on this, the production sales gains, the profit from the overall business, the financial and market stability of the enterprise could be controlled and forecast.

### REFERENCES

1. Chukov, K.& Ivanova, R. (2019). Financial and economic analysis. Sofia. IK – UNWE.
2. Chukov, K. (2019). Analysis of net revenue from product sales. Sofia. E-magazine IDES - issue 4.
3. Chukov, K. (2020). Analysis of profitability of sales. Sofia. E-magazine IDES - issue 2.
4. Chukov, K. & Ivanova, R. (2022). Financial and economic analysis. Sofia. IK – UNWE.
5. Ivanova, R. (2020). Analysis of the profitability of the company's assets /on the example of industrial enterprises/. Sofia. IC- UNWE.
6. Todorov, L. (2003). Profitability and business risk. Models and methods of analysis. Sofia. Thrace - M.
7. Todorov, L. (2014). Modern Business Valuation Models. Sofia. A new star.
8. Todorov, L. (2017). Business efficiency - methodological and applied aspects of analysis and control. Sofia. E-magazine IDES - issue 4.
9. Todorov, L. (2022). The analysis of sales and the safety zone - an important part of the company's anti-crisis management. Sofia. E-magazine IDES - issue 3.
10. Todorov, L. (2023). Practical aspects of sales analysis and the company's safety zone. Sofia. IDES e-magazine - issue 1.