THE IMPACT OF FINANCIAL RISK OF INDUSTRIAL ENTERPRISES ON THE SUSTAINABLE DEVELOPMENT OF THE ECONOMY OF THE REPUBLIC OF MOLDOVA

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Abstract: *The financial stability of manufacturing enterprises and the profitability of their activities are the key to the sustainable development of the industry. For the period of 2015-2020 there is a stable growth of key performance indicators of enterprises (sales revenues and net profit), their financial stability is increasing. Based on the existing structure of funding sources and approaches to asset funding, we compare the actual level of the financial leverage ratio with its normative value. Under the conditions of worsening business climate in Moldova under the influence of inflation growth, increase of interest rates, disruption of supplies, higher prices for energy, etc., it is advisable to increase the financial stability of manufacturing enterprises to a level that ensures business financing from own and borrowed sources in equal proportions. The possibility to form a normal level of current assets reserve will make it possible to reduce financial risks and ensure guaranteed profits. According to the results of the correlation analysis it was possible to conclude that the change of manufacturing enterprises financial profitability has a significant influence on the dynamics of production volume, therefore the optimal structure of the capital and efficiency of its use should be a subject of constant control of the management of these enterprises to provide sustainable development.*

Keywords: *financial stability of industrial enterprises, financial leverage ratio.*
Jel Classification: *G32, L60, O14.*

1. Introduction

Today, the manufacturing industry of developed countries serves as an unlimited space for the introduction of innovation and increasing productivity (Organizatsiya Ob"edinennykh Natsii po Promyshlennomu Razvitiyu, 2016).

Thanks to new technologies, the production of industrial products becomes more efficient and competitive. There is a gradual transformation of processes from labor-intensive to technology-intensive and capital-intensive processes.

New technologies used in the manufacturing industry cause cost minimization and profit growth. This, in turn, ensures the financial sustainability of enterprises and the efficient use of equity invested in property.

In the long term, support and diversification of the manufacturing industry guarantees enterprises to achieve high growth rates and to maintain them for a longer period of time (Organizatsiya Ob"edinennykh Natsii po Promyshlennomu Razvitiyu, 2016.

2. Research methods

The toolkit of the analysis is a kind of stochastic factor analysis - correlation analysis, which allows to comprehensively study and measure the influence of factors on the economic phenomenon, when the relationship between the arguments and the result indicator has a probabilistic nature.

This way of analysis expands possibilities of research due to inclusion of variables, for which there is no functional connection with economic phenomenon.

Thus, by means of correctly chosen mathematical equation of regression it is possible to consider desirable factors and their influence on result indicator.

3. Results and discussion

Moldova's manufacturing industry accounts for a fifth of GDP (Biroul Național de Statistcă al Republicii Moldova, 2020b), and its production increases annually by an average of 2.073 billion lei (results of the correlation analysis presented below).

The dynamics of industrial production for the period 2015-2020, as well as a number of key indicators are presented in Table 1.

Table no. 1. Key indicators of manufacturing enterprises

Indicators	2015	2016	2017	2018	2019	2020
Number of enterprises, units	4482	4535	4686	4860	4906	5024
Average number of employees, persons	92518	95097	103531	107962	108369	103880
Sales revenues, mln. lei	43130.3	45944.2	50024.3	52960.7	57061.9	57051.5
Net profit of the reporting period, mln. lei	544.3	2187.7	2462.2	2143.0	2519.3	2471.9

Source: Biroul Național de Statistcă al Republicii Moldova, 2020a; Biroul Național de Statistcă al Republicii Moldova, 2021

During the period under review, the number of manufacturing enterprises increased by 12.1%, the average number of employees increased by 12.3%. There is a positive dynamics of revenues from sales, which increased by 32.3% for the period from 2015 to 2020. The net profit of enterprises increased by more than 4.5 times in the period under review.

The increase in the key performance indicators of manufacturing enterprises had a favorable impact on the profitability of their activities (Table 2).

Table no. 2. Profitability indicators of industrial enterprises, calculated on the basis of net profit

Indicators	2015	2016	2017	2018	2019	2020
Profitability of income from sales, %	1.3	4.8	4.9	4.1	4.4	4.3
Return on assets, %	1.0	3.9	4.0	3.3	3.8	3.5
Return on equity, %	2.6	9.7	9.8	7.9	8.9	8.7

Source: Biroul Național de Statistcă al Republicii Moldova, 2020a.

Positive growth dynamics is observed in general for all profitability indicators. At the same time, it should be noted that their evolution is unstable, and the level achieved in 2020 is insufficient in terms of general recommendations.

To ensure the sustainable development of the industry and its attractiveness from the point of view of investment realization, the level of financial profitability of industrial enterprises should correspond to the changes taking place at the macro level. In particular, if in 2020 the weighted average interest rate on newly attracted deposits for legal entities in the national currency was 2.71 % (Banca Națională a Moldovei, 2020a), and the weighted average interest rate on newly issued loans was 8.49 % (Banca Națională a Moldovei, 2020b) respectively, then taking into account the possible deterioration of the

economic situation on a global scale and the increase in inflation and the prime rate, it is necessary to take a serious approach to the financing of manufacturing industry enterprises, finding the optimal ratio of funding sources, maintaining their financial profitability, etc.

The evolution of the size and structure of capital of manufacturing enterprises for the period of 2015-2020 is shown in Figure 1.
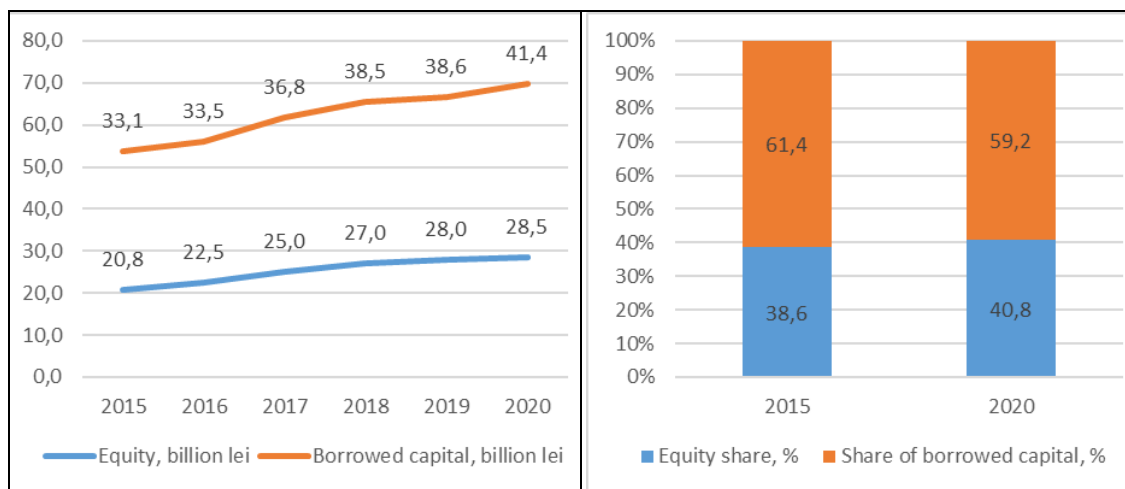

Figure no. 1. Evolution of the size and structure of capital in the manufacturing industry
Source: Biroul Național de Statistcă al Republicii Moldova, 2020a

There is a systematic increase in the amount of equity and borrowed capital of manufacturing enterprises, the chain growth rate of borrowed capital in 2020 exceeded the growth rate of equity by 5.5 percentage points (Biroul Național de Statistcă al Republicii Moldova, 2020a).

Borrowed funds prevail in the composition of the sources of financing of the property of manufacturing enterprises for the period of 2015-2020.

During the period under consideration the financial independence of the analyzed enterprises from external creditors slightly increased, in particular the share of equity in the total cost of capital was 40.8% in 2020 (Table 3).

Table no. 3. Capital structure coefficients of manufacturing enterprises

Indicators	2015	2020
Financial autonomy coefficient	38.6	40.8
Ratio of debt and equity (financial leverage)	1.594	1.452
Coefficient of total equity coverage	2.594	2.452

Source: Biroul Național de Statistcă al Republicii Moldova, 2020a

It seems interesting to estimate the optimality of the structure of the sources of financing the property of the manufacturing enterprise in 2020 on the basis of determining the normative value of the financial leverage coefficient. This indicator is an indicator of financial risk.

For definition of its normative value it is necessary to examine the current structure of assets in interrelation with known approaches to their financing (Savickaja, 2017; Gheorghița, Stratila, 2016).

The greatest focus in the issues of financing the assets of the enterprise is made on the study of the value of current assets (Nalog-nalog.ru, 2018), on which, to a large degree, depends on the operating activity.

The conservative approach creates significant reserves for financing current assets for contingencies, which ensures the maximum protection of the business (Znaniya dlya biznesa KPiLIB, 2014).

The moderate approach ensures the current need for working capital, and also maintains an adequate level of reserves of current assets (Znaniya dlya biznesa KPiLIB, 2014).

The aggressive approach minimizes the size of the reserve stock of current assets in the conditions of business environment stability, which guarantees the highest efficiency of the enterprise property use (Znaniya dlya biznesa KPiLIB, 2014).

Each approach has certain advantages and disadvantages, so the choice of one of the possible approaches should correspond to the specific situation in which the enterprise is constantly monitoring the availability of equity capital.

The calculation of financial leverage coefficient depending on the approaches of enterprise assets financing is presented below:

a) Under the conservative approach
Equity concentration = 42,2 * 0,9 + 22,5 * 1 + 35,3 * 0,5 = 78,08 %;
Borrowed capital concentration = 100 - 78.08 = 21.92 %;
Financial leverage ratio = 21.92 / 78.08 = **0.281**.
b) Under the moderate approach.
Equity concentration = 42.2 * 0.8 + 22.5 * 0.75 + 35.3 * 0 = 50.64 %;
Borrowed capital concentration = 42.2 * 0.2 + 22.5 * 0.25 + 35.3 * 1 = 49.26 %;
Financial leverage ratio = 49.26 / 50.64 = **0.973**.
c) under aggressive approach.
Equity concentration = 42.2 * 0.6 + 22.5 * 0.5 + 35.3 * 0 = 36.57 %;
Borrowed capital concentration = 42.2 * 0.4 + 22.5 * 0.5 + 35.3 * 1 = 63.33 %;
Financial leverage ratio = 63.33 / 36.57 = **1.732**.

The obtained results allow to conclude that with alternative approaches to the financing of assets, the level of concentration of equity and borrowed capital varies in a wide range.

Based on the actual value of the coefficient of financial leverage (0.973 <1.452 <1.732 in 2020, Table 3) with the existing value of constant and variable parts of current assets (Chernik, 2014; Biroul Național de Statistcă al Republicii Moldova, 2020a), it becomes obvious that the manufacturing enterprises carry out a more aggressive approach rather than a moderate approach to the financing of their assets. However, in the context of the current deterioration of the economic situation in Moldova (negative consequences of the Covid 19 pandemic, increase of inflation and interest rates on loans, etc.) (United Nations, 2022), it seems appropriate to reduce the financial risk of manufacturing enterprises in favor of a moderate approach to asset financing.

This measure on the one hand leads to a decrease in financial profitability in the short term (with the unchanged value of profit). On the other hand, in order to ensure long-term functioning of manufacturing enterprises it is necessary to minimize the risks associated with potential bankruptcy in conditions of complex activity forecasting. Thus, increasing

financial stability should be considered as a condition for the stability of production volumes of manufacturing industry enterprises, as well as a guarantee of maintaining an acceptable level of financial profitability.

In the course of the correlation analysis we were able to establish a high degree of correlation between the indicators of production volumes and financial profitability.

The initial data for the correlation analysis is presented in table 4.

The equation of multiple correlation got the following form:

$Yx = 49.8687 + 0.4819 \, x1 + 2.0734 \, t.$

The economic value of the regression coefficients can be interpreted as follows:

- $b1 = 0.4819$, the regression coefficient at factor $x1$ means that a 1% increase in return on equity will result in a 0.4819 billion lei increase in manufacturing output;

Table no. 4. Input data for the correlation analysis

Number of observations	Production volume of manufacturing industry, billion lei (Y)	Return on equity of manufacturing enterprises, % (X1)	Time, years (X2)
1 (2015)	52.9	2.62	1
2 (2016)	57.2	9.71	2
3 (2017)	61.3	8.84	3
4 (2018)	63.4	7.95	4
5 (2019)	66.4	8.99	5
6 (2020)	64.1	8.68	6

Source: Biroul Național de Statistcă al Republicii Moldova, 2020a; Biroul Național de Statistcă al Republicii Moldova, 2020c

- $t = 2.0734$, the regression coefficient for factor t means that manufacturing output increases annually by an average of 2.0734 billion lei.

Checking the regression coefficients by Student's test showed that their value is considered significant, because all calculated t_{calc} are greater than the tabulated SEB (Table 5).

Table no. 5. Regression coefficients according to Student's test

Parameter	Coefficient	SEB	t_{calc}
b 1	0.4819	0.4534	1.0657
b 2	2.0734	0.6299	3.2917

Source: prepared by the authors.

Value of multiple correlation can be estimated by Fisher's criterion: $F^* = 11,580$. Using Fisher's table depending on number of degrees of freedom $f_1=6$, $f_2=6-2-1=3$ and significance level $q=0.05$, $F_{tabel} = 8.94$ is determined (Novyi semestr, 2019). Assuming that $F^* > F_{tabel}$, the value of the multiple correlation coefficient is considered significant.

The multiple correlation coefficient $R = 0.9409$ indicates the presence of a close correlation relationship between the volume of manufacturing industry and the factors under study.

The coefficient of determination $R^2 = 0.8853$ means that the change of production volume of manufacturing industry by 88.5 % is caused by the influence of the selected factors.

4. Concluding remarks

Ensuring the sustainable development of industry is largely due to the introduction of innovations that ultimately lead to the reduction of production costs and expenses. Over the period 2015-2020, there has been a steady growth in the profitability of the manufacturing industry. The share of manufacturing industry in the gross domestic product (GDP) also remains stable at around 20.0%.

During the period under consideration there was a slight decrease in the financial dependence of enterprises on external creditors, the specific weight of borrowed capital in 2020 was 59.2%. The actual value of the financial leverage coefficient as an indicator characterizing the level of financial risk showed that the aggressive approach was used in financing the assets of the enterprise in 2020 (the actual level of the financial leverage coefficient is close to the normative).

The obtained results allow us to conclude that it is reasonable to reduce the financial risk by increasing the proportion of own capital to 50% in the structure of funding sources in the future. This measure will allow to increase financial stability, to form reserves of current assets, to guarantee stable production volumes.

On the basis of the results received in the course of the correlation analysis we managed to conclude that the production volume of the processing industry is greatly determined by the efficiency of the use of equity capital. In order to ensure a sustainable development of the industry, which contributes substantially to the development of the economy of Moldova, it is necessary to control strictly the size and the share of sources of business financing from the point of view of achieving their optimal ratio and the highest efficiency of their use.

In further research, it seems interesting to assess the optimality of the ratio of own and borrowed sources of financing of the property of manufacturing enterprises of the Republic of Moldova by using some other criteria of optimization of the structure of capital: minimization of the weighted average cost of total capital, maximization of the profitability level of own capital.

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