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METHODOLOGY FOR ASSESSING THE FINANCIAL STABILITY OF THE TRADE NETWORK

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Abstract. *The article emphasizes that in the current economic situation, assessing the financial condition of enterprises is one of the key tasks for ensuring their stability and effective development. Alternative approaches to assessing the financial condition of enterprises are analyzed. The study is based on a detailed analysis of the financial condition of the Silpo-Food retail chain using the Altman model. The results of the financial analysis are summarized and key indicators that affect the financial stability of the network are highlighted. Based on the obtained analysis results, an improved Altman model is proposed with the inclusion of the EBITDA margin indicator. The main hypothesis of the study is that the inclusion of the EBITDA margin in the Altman model will allow for a more accurate and relevant assessment of the financial stability of the retail network.*

Keywords: *analysis, financial condition, Altman model, bankruptcy risk, EBITDA margin, investment attractiveness*

Introduction.

The financial stability of commercial enterprises is a key factor in their successful operation in today's dynamic market environment. In conditions of increasing competition and instability of the economic environment, maintaining financial stability becomes a priority for every enterprise. However, to achieve this goal, it is necessary to solve a number of problems that may affect the financial stability of the enterprise. One of the important tools for ensuring financial stability is the use of financial condition assessment models that help predict the probability of bankruptcy and identify potential financial risks. The significance of financial stability assessment models lies in their ability to predict the probability of bankruptcy of an enterprise and provide enterprise managers with important information for making informed decisions.

Analysis of recent research and publications

Among foreign scientists who in their works paid significant attention to the study of the importance and features of assessing the financial condition of enterprises, the following should be highlighted: Edward I. Altman - his most famous model, Z-Score,

allows you to assess the probability of bankruptcy based on the company's financial indicators [1,2]. William G. Beaver - his research focuses on the analysis of financial data and the use of statistical methods to assess the financial condition of enterprises [3]. Richard Taffler developed a model for assessing the probability of bankruptcy of enterprises. His model is based on the analysis of financial ratios, such as profitability, liquidity, asset efficiency and financial structure [4], etc. [5].

Also, the problems of assessing the financial condition of domestic enterprises are given great attention by leading scientists and economists. Among them, it should be noted: O.O. Tereshchenko, in his works, considers various approaches to financial analysis, paying special attention to the problems of financial risk and assessing the effectiveness of management of financial resources of enterprises [6,7]. A.V. Matviychuk investigated methods for assessing the financial condition of enterprises, with particular emphasis on forecasting financial risks. She also developed models that allow determining the most vulnerable aspects of the financial activities of enterprises [8]. O.A. Parshina, V.G. Myachyn, M.V. Kutsynska conducted research in the field of financial analysis, in particular, using mathematical models to assess the financial condition of enterprises [9,10], etc.

Identification of previously unresolved parts of the general problem. However, despite the significant scientific achievements of domestic and foreign scientists, existing approaches need to be improved, in particular, taking into account the characteristics of the domestic economic environment and the development of the financial market, which are constantly changing.

Purpose and objectives of research The purpose of this study is to improve the Altman model for a more accurate and relevant assessment of the financial stability of a retail chain. The tasks are to develop recommendations for improving the financial condition of a retail chain, taking into account the results of the analysis; adapt the Altman model to changes in the economy and the market; include modern financial indicators to increase the accuracy of the model.

Main research materials

To conduct an analysis of financial performance and provide an overall

assessment of the financial condition, the retail chain Silpo-Food LLC was selected. The information base for the analysis was the financial statements of the chain for the period 2019-2023, in particular, balance sheets and financial statements were used [11].

The main financial and economic indicators of the network are given in table 1.

Table 1 - Analysis of financial indicators of Silpo-Food LLC for 2019-2023,

(mln. UAH)

Indicators	2019	2020	2021	2022	2023	Absolute deviations (2023/2019)	Relative deviations (%)
II. Current assets	14004	14811	15008	11454	12971	-1032	-7,37
Net financial result: profit	289					-289	-100
Net financial result: loss		-3114	-1846	-7 632	-1850	-1,850	-
Balance sheet currency	28694	30235	38660	33668	33358	+4663	+16,26
Financial result before tax: profit	268					-268	-100
Financial result before tax: loss		-3157	-1926	-7436	-1850	-1850	-
I. Equity	1804	-1148	-3057	-10689	-10434	-12239	-678,12
II. Long-term liabilities and provisions	9130	12285	13611	15998	14045	+4914	+53,83
III. Current liabilities and provisions	17758	19083	28105	28359	29747	+11988	+67,50
Net income from sales of products (goods, works, services)	62446	64402	72 784	69 991	84727	+22281	+35,68

Source: compiled by the author based on [11]

Current assets showed growth during 2019-2021, however, there was a significant decline in 2022. In 2023, there was a recovery in growth by 13.25%. Despite this, compared to 2019, current assets in 2023 decreased by 7.37%, which indicates some liquidity difficulties. This may indicate instability in the use of current assets. To improve the financial condition of a trading enterprise, it is recommended to optimize inventories by improving inventory management processes, which will avoid excess inventory that freezes capital.

Over the past four years, the company's net financial result has been unprofitable, which may indicate problems with profitability. In particular, from 2022 to 2023, there is a decrease of 75.76%. The relative deviation is -100%, i.e. the lack of profit in subsequent years indicates significant difficulties in the company's operational activities and the likely accumulation of losses.

According to the data, the balance sheet currency showed growth from 2019 to 2021, however, in 2022 and 2023 there is a decrease of 0.92%. This decrease is associated with a decrease in assets by UAH 310,349 thousand. However, the overall increase in the balance sheet currency by 16.26% for the period 2019-2023 indicates an increase in the company's assets. This growth is the result of an increase in long-term liabilities. At the same time, the decrease in assets in 2022-2023 is due to losses, write-offs of assets that affected the assets of the retail network.

During the period from 2019 to 2023, the retail chain's equity continuously decreased by -678.12%. Negative equity means that the retail chain's liabilities exceed its assets, meaning that there was a constant generation of losses, which resulted in their accumulation and led to negative equity.

Despite a slight improvement in 2023, there was a decrease of 2.38% and equity remained negative, indicating ongoing financial problems. Negative equity means that the retail chain's liabilities exceed its assets, indicating a constant generation of losses and their accumulation, which led to negative equity. Long-term liabilities increased until 2022, but in 2023 they decrease by 12.20%. This indicates the repayment of long-term liabilities and a decrease in their growth.

Current liabilities have been steadily increasing over the period under review. In particular, there is a 4.9% increase between 2022 and 2023, indicating an increase in liabilities. A significant increase in current liabilities for the period 2019-2023 by 67.50% indicates an increase in the company's financial burden and liquidity difficulties. Current liabilities are potentially problematic for the retail chain due to low liquidity indicators (table 2).

The indicators of current and quick liquidity ratios (table 2) are lower than 1, which indicates possible difficulties in covering short-term obligations. The retail

chain's net income during the period from 2019 to 2023 had an increasing trend, although a decrease was observed in 2021-2022. The most significant growth occurred in 2022-2023 by 21.5%, which indicates an increase in product sales and a significant improvement in financial indicators.

Table 2 - Liquidity indicators of Silpo-Food LLC

Indicators	2019	2020	2021	2022	2023
Current liquidity ratio	0,19	0,78	0,53	0,40	0,44
Quick liquidity ratio	0,27	0,23	0,24	0,13	0,27

Source: calculated by the author based on [11]

The following models are currently known for assessing the financial condition: Taffler, Tereshchenko, and others [4,5,6]. The models mentioned provide a comprehensive approach taking into account various financial indicators and high accuracy in predicting the bankruptcy of enterprises. However, they are less flexible due to the lack of constant updating or the limited variables used in the calculations.

The most common Altman Model can be adapted to analyze the financial condition of companies in various industries, such as manufacturing, trade, services, technology, etc., which makes it universal. The weights of the variables of this model can be adjusted according to the specifics of the industry.

Today, the country's trading enterprises are in a difficult financial situation due to economic instability, therefore, using the Altman model, an analysis and forecast of the financial condition of Silpo-Food LLC was conducted:

$$Z=1.2X_1+1.4X_2+3.3X_3+0.6X_4+1.0X_5$$

where: x_1 - working capital to assets ratio; x_2 - retained earnings to assets; x_3 - profit before tax and interest to assets; x_4 - cost of equity to liabilities; x_5 - asset turnover.

The financial stability and bankruptcy risk indicators of Silpo-Food LLC were calculated according to the balance sheet data for 2019-2023 and are summarized in table 3.

The net working capital to total assets ratio (x1) is negative throughout the years, indicating negative working capital. This means that short-term liabilities exceed current assets, which is a negative sign for the company's financial stability.

Table 3 - Financial stability and bankruptcy risk indicators of Silpo-Food LLC

Indicators	2019	2020	2021	2022	2023
Net working capital to total assets ratio, x1	-0,131	-0,141	-0,339	-0,050	-0,503
Retained earnings to assets, x2	0,0101	-0,103	-0,047	-0,023	-0,055
Return on assets ROE, x3	0,01	-0,104	-0,050	-0,221	-0,055
Financial stability ratio, x4	0,067	-0,036	-0,073	-0,241	-0,238
Financial independence ratio, x5	2,176	2,130	1,882	2,078	2,539
Z- Altman	2,10	1,45	1,20	1,07	1,53
Bankruptcy risk	середній	високий	високий	високий	високий

Source: calculated by the author

In 2019, the retained earnings to assets (x2) ratio was positive (0.0101), but in subsequent years it became negative, indicating the accumulation of losses and a lack of profit for distribution.

Return on assets (x3) was negative from 2020 to 2023, indicating that the company was not using its assets effectively to generate profit. This could be a result of loss-making operations or significant expenses.

Financial stability ratio indicators (x4) show a negative value from 2020 to 2023, indicating a high dependence on liabilities and a low share of equity in financing assets.

The financial independence ratio (x5) has a value above 1 in all years, indicating the company's ability to generate sufficient sales relative to its assets. The highest value (2539) is observed in 2023, indicating an improvement in sales.

The Z-score values indicate that the company is at risk of bankruptcy. In 2019, the risk of bankruptcy was medium, but since 2020 it has increased significantly to a high level, indicating significant financial problems.

Thus, the general trend of indicators for 2019-2023 indicates a deterioration in the financial situation of Silpo-Food LLC. Key challenges include declining liquidity, profitability, and financial stability. On the positive side, there is some improvement in the financial independence ratio in 2023.

The Altman Z-score formula is fixed and consists of five components, each of which has its own weighting factors and uses specific financial indicators.

In order to provide a more accurate assessment of the company's financial condition, we propose to improve the Altman model by including the EBITDA margin

as the sixth component (x6).

Adding EBITDA margin to the model will provide an improved reflection of current financial conditions and the characteristics of the trading industry.

In the process of forming and calculating the improved Z-score model, taking into account the importance of each of the six indicators, weighting factors were determined for assessing financial stability:

$$Z=1.0x_1+1.1x_2+2.5x_3+0.4x_4+0.8x_5+2.0маржа\ EBITDA$$

Each coefficient has its own weight, which takes into account its impact on the overall bankruptcy risk assessment. To test the model, we used financial data to calculate EBITDA for 2019 and 2020, since data for 2021-2023 is missing (table 4).

Table 4 - Bankruptcy risk indicators of Silpo-Food LLC taking into account EBITDA margin

Indicators	2019	2020
EBITDA	9749554	10188927
Net income from sales of products	62446681	64402634
EBITDA margin	0,15	0,16
Altman's Z- + EBITDA margin	1,98	1,5
Bankruptcy risk	середній	високий

Source: calculated by the author

Analysis of the results of Table 3 shows that in 2019, according to the Altman model, the financial condition indicator was 2.10 (table 2), and taking into account the EBITDA margin - 1.98. In 2020, this indicator was 1.45 and 1.50, respectively. The obtained EBITDA margin data indicate an improvement in the company's operating profitability compared to overall financial profitability.

Although the results indicate that the operating profitability of the retail chain was lower than the overall financial profitability during this period, EBITDA margin indicators remain high. This demonstrates Silpo-Food LLC's ability to effectively manage costs and maintain operating profitability, despite its difficult financial situation.

Thus, including EBITDA margin in the Altman model allows for a more accurate assessment of operating activities, which can improve the prediction of its financial

condition and bankruptcy risk. The Altman model provides an overall assessment of a company's financial condition, but does not always take into account all aspects of operating activities, which may lead to certain deviations in results.

Conclusions.

The improved Altman model with EBITDA margin can help a retail chain assess how effectively it manages its operating expenses and the ability to identify potential financial problems at an early stage, allowing management to take timely measures to ensure financial stability. It takes into account the financial indicator "EBITDA margin", which provides a more accurate assessment of the operational efficiency of the retail network. This makes the improved model more effective for analyzing financial sustainability in the current economic environment compared to the classic Altman model.

Investors can use the improved model to assess how effectively management is managing operating costs and resources, helping to identify retail chains with the potential to improve financial performance.

Thus, the modified Altman model with EBITDA margin can become an important tool for retail chains, providing a more accurate and comprehensive assessment of its financial condition and development prospects.

The most complete verification of the improved Altman model with EBITDA margin was hindered by the limited availability of financial statements of the studied and other retail chains. Therefore, taking into account the obtained complete information on their financial activities, it is advisable to continue research in this direction.

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Анотація. *У статті наголошено, що у умовах сучасного стану економіки, оцінка фінансового стану підприємств є однією з ключових задач для забезпечення їхньої стабільності та ефективного розвитку. Проаналізовано альтернативні підходи до оцінки фінансового стану підприємств. Дослідження базується на детальному аналізі фінансового стану торгівельної мережі «Сільпо-Фуд» за допомогою моделі Альтмана. Узагальнено результати фінансового аналізу та виділено ключові показники, що впливають на фінансову стійкість мережі. На основі отриманих результатів аналізу запропоновано удосконалену модель Альтмана з включення показника маржі EBITDA. Основна гіпотеза дослідження полягає в тому, що включення маржі EBITDA у модель Альтмана дозволить отримати більш точну та релевантну оцінку фінансової стійкості торговельної мережі.*

Ключові слова: *аналіз, фінансовий стан, модель Альтмана, ризик банкрутства, маржа EBITDA, інвестиційна привабливість*