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THE PROCESS OF BUILDING AN ECONOMIC AND STATISTICAL MODEL FOR ANALYZING THE FINANCIAL STABILITY OF AN ENTERPRISE

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Financial stability is a vital indicator that not only reflects the current financial health of an organization but also acts as a key tool for forecasting its future growth prospects and long-term viability. This indicator plays an essential role in evaluating the efficiency of an enterprise's financial and economic activities and guides management in making informed decisions. The process of economic and statistical analysis of financial stability must be structured in such a way that it provides an unbiased and objective assessment of the organization's future development potential, enabling corrective measures to strengthen its financial stability, adjust its level, and assess the risks involved in investing and lending. This article thoroughly explores and summarizes the various methods and approaches used during the economic and statistical analysis of the financial stability of business entities. It presents the sequence of analyzing key financial stability indicators, reveals their interconnections, and evaluates the overall effectiveness of the economic and statistical analysis process. The methodology applied to this analysis is deeply rooted in the methods of financial analysis, with particular emphasis on understanding and evaluating the capital structure of the organization. The qualitative aspect of the analysis is crucial as it helps determine the probable nature of financial changes, allowing for the assessment of whether correlational methods should be employed. Moreover, it reveals the causal relationships between different variables, distinguishes between endogenous and exogenous factors, and identifies dependencies, which are presented in the form of various types of graphical models or curves. The concept of financial sustainability is complex and multifaceted, and its accurate assessment requires a deep understanding of the entire process of extended reproduction and its related interactions. The study of capital structure is key to understanding changes in equity capital and identifying potential ways to replenish it, which has a direct impact on the overall financial and economic effectiveness of the enterprise.

Key words: *financial stability, financial health, data analysis, factor analysis, equity capital, debt capital.*

Лобода О. М. Процес побудови економіко-статистичної моделі для аналізу фінансової стабільності підприємства

Фінансова стабільність є важливим показником, що характеризує не лише поточний фінансовий стан організації, але й є основою для прогнозування її розвитку та здатності до підтримки стабільності в майбутньому. Це ключова ознака ефективності фінансово-господарської діяльності та прийняття управлінських рішень. Процес економіко-статистичного аналізу фінансової стабільності підприємства має бути організований так, щоб забезпечити об'єктивну оцінку майбутніх перспектив розвитку організації, а також дозволити своєчасно вжити заходів для зміцнення фінансової стабільності, коригувати її рівень і оцінювати ризики, пов'язані з інвестиціями та кредитуванням підприємства. У статті наводиться аналіз основних методів і підходів, що використовуються при економіко-статистичному аналізі фінансової стабільності економічних суб'єктів. Докладно описано послідовність аналізу показників фінансової стабільності, розкрито їх взаємозв'язки, а також оцінено ефективність застосування економіко-статистичних методів. Методологія аналізу ґрунтується на методах фінансового аналізу, зокрема на вивченні структури капіталу підприємства, яка є важливою складовою фінансової стабільності. Якісний аналіз дозволяє оцінити ймовірні зміни у фінансових показниках та визначити доцільність використання кореляційних методів для оцінки зв'язків між ними. Також важливим етапом є виявлення причинно-наслідкових зв'язків, розмежування ендогенних та екзогенних факторів, вивчення залежностей між різними параметрами

та представлення цих залежностей у вигляді графічних моделей чи кривих. Оцінка фінансової стабільності підприємства є складним процесом, оскільки вона вимагає глибокого розуміння взаємозв'язків у процесі розширеного відтворення. Методологія економіко-статистичного аналізу фінансової стабільності охоплює систему показників, які можна оцінювати як за кількісними, так і за якісними характеристиками. Вивчення структури капіталу також включає аналіз змін у власних джерелах фінансування та пошук можливих шляхів їх поповнення, що впливає на загальну ефективність фінансово-господарської діяльності підприємства.

Ключові слова: *фінансова стабільність, фінансовий стан, аналіз даних, факторний аналіз, статутний капітал, борговий капітал.*

Problem solving. The evaluation of financial and credit stability stands as a crucial measure of an organization's financial health, holding significant value within a market-driven economy. Both external and internal users of financial statements find it essential to assess currency stability, forecast the company's future growth, and adjust management strategies based on identified financial risks. The primary objective of analyzing the financial stability of a business entity is to establish favorable conditions for achieving long-term strategic goals, with profitability being just one of several key considerations. The significance of this research is indisputable, as financial stability metrics are vital across all sectors, influencing the organization's financial standing and its competitive edge. The concept of financial stability encompasses a broad overview of an organization's financial condition, and the insights gained from its analysis are valuable to both internal stakeholders and external parties. The methodology behind this analysis is closely linked to financial condition evaluation techniques, with particular emphasis on understanding the company's capital structure.

Analysis of recent research and publications. The process of analyzing financial stability is presented in a structured manner, ensuring a low probability of making overly optimistic predictions regarding the organization's future development and the necessary approaches for achieving financial objectives. The analysis also addresses the correction of stability levels and the assessment of risks associated with investments and lending to businesses [1, pp. 24-32].

The mathematical model employed in this analysis provides a sophisticated theoretical and economic framework essential for the organization's survival. This model helps to understand the emotional dynamics of changes in financial phenomena, enabling the application of correlation methods [2, pp. 56-61]. Furthermore, the analysis uncovers the probabilities of various events, identifies causal relationships, and distinguishes between endogenous and exogenous factors, as well as highlighting phenomena with varying parameters, which are then represented graphically in multiple types of curves [3].

The complexity of this process may arise during the final stages of economic and mathematical modeling, particularly when there is a lack of multiple estimates of different economic phenomena. Initially, exogenous factors are identified, which can be theoretically explained through further study of the phenomena [4, pp. 56-61]. Subsequently, based on specialized research (such as correlation and elasticity coefficients), these exogenous factors can be incorporated into models with specific indicators. Each analysis is conducted individually, following the same procedures, but is not tied to multiple analyses. The choice of correlation models focuses on improving the accuracy of the analysis, identifying the various reasons for studying the phenomena, and pinpointing the key factors that influence them [5, pp. 64-68].

Purpose of the article. The assessment of financial sustainability is a multifaceted concept that requires a comprehensive understanding and thorough analysis of the entire

cycle of expanded reproduction. This process cannot be accurately evaluated without considering the intricate interactions and dynamics that shape the financial health of an organization over time. Financial sustainability is not merely a snapshot of an organization's current position, but a continuous evaluation that involves assessing long-term stability, resilience, and the ability to maintain operations and growth amidst changing economic conditions.

Presentation of the main material of the study. The development of models incorporating a large number of variables involves several critical stages:

1. Identification of key causes or external factors that influence the outcome.
2. Establishing the specific relationships between various products and their outcomes from the selected external factors, while considering the impact of additional variables.
3. Constructing a multiple regression model that accounts for the influence of all relevant external factors.
4. Developing an algorithm for selecting the parameters that will be included in the multiple regression model.
5. Evaluating the significance of the multiple regression model by utilizing additional determination coefficients and other statistical indicators.

Additionally, it is important to assess how residents respond to changes in external factors and examine the role of officials in relation to local elasticity factors.

The process of economic modeling begins with identifying and selecting the relevant factors and external elements that will be incorporated into the model. Accounting for all potential factors and exploring every possible relationship can complicate the model and reduce its applicability to real-world economic development. A key challenge lies in finding the right balance between model simplicity and the accuracy of the results. During the modeling process, it is essential to highlight the most significant variables, downplay less critical ones, and focus on those that directly influence the situation at hand. This approach can simplify the model, leading to a more accurate representation of the actual economic process. Achieving the desired level of accuracy often requires testing multiple variations of the model before identifying the most effective solution.

When examining the methods of economic and statistical analysis of financial stability presented in economic literature, several distinct approaches can be identified: traditional, resource-based, stochastic analysis, approaches grounded in fuzzy set theory, as well as methods and models rooted in other principles.

The traditional approach focuses on the identification of both absolute and relative indicators that represent the structure of financing sources and assets, their interrelationships, and their evaluation in terms of optimal funding for assets through appropriate sources. Key factors such as liquidity, solvency, business activity, and the effectiveness of various operational spheres are crucial in maintaining monetary stability. The primary strength of this method is its ability to offer a holistic view of financial stability, making it one of the most objective approaches that accounts for multiple influencing factors.

The resource-based approach, as its name suggests, places emphasis on the resources utilized by an economic entity, including their quantity, structure, and utilization. This approach assesses these characteristics based on their intensity or level of development. The evaluation can consider both intensity and volume, or a combination of intensive-extensive and comprehensive-intensive measures. Intensive business growth is closely associated with absolute financial stability. However, a limitation of this

resource-focused method is its lack of attention to the efficiency of resource management. As a result, within a market economy, this approach has evolved into a resource management approach. The resource management perspective posits that financial stability can only be achieved if management costs are productive and do not surpass the rate of resource growth. This comparison is made by evaluating the ratio of administrative costs to resources, adjusted for the volume of production or sales.

Stochastic analysis is applied when there is no direct correlation between the variables being analyzed, and its use is essential for evaluating indirect relationships. Financial stability is influenced by a multitude of factors, many of which elude precise mathematical modeling and thus require statistical analysis for accurate assessment. One of the key advantages of such models is their ability to forecast future financial stability, rather than merely assessing its present state. This approach demands significant resources and is most effective when employed regularly, as it relies on the unique characteristics of the organization under analysis. The approach based on fuzzy set theory involves establishing imprecise boundaries for each financial indicator. These fuzzy boundaries are used to differentiate between various financial states, such as absolute stability, normalcy, instability, crisis, and extreme crisis situations. By employing this method, quantitative estimates of calculated indicators and their subsets are derived, enabling a more nuanced evaluation of financial stability.

Table 1 provides a comparison of various methodologies for economic and statistical analysis of financial stability. Each approach presents its own strengths and weaknesses. The selection of a specific method hinges on factors such as the expertise of analysts, the volume of available data, the analysis's objectives, the time frame for its completion, and the existence of comparative benchmarks. In contemporary market economies, it is common to employ a combination of different analytical approaches. The integration of the traditional approach with stochastic analysis is often regarded as especially effective, as it allows for a synthesis of historical analysis with future projections. In evaluating financial stability, various financial analysis techniques are commonly utilized, employing a range of indicators derived from financial statements and their corresponding calculations:

• Horizontal analysis: This method involves calculating and evaluating changes in financial indicators over time, comparing the current period with previous years as reflected in the annual financial statements.

• Vertical analysis: This approach focuses on determining the percentage contribution of individual indicators or groups of indicators to the total amount, offering insights into their relative importance.

• Trend analysis: Used to identify the prevailing direction of changes in a particular indicator by calculating growth rates or profits across several reporting periods. This method helps in understanding the trajectory of the organization's. financial condition.

• Ratio analysis involves calculating the relationships between different financial indicators. Numerous indicators are recommended in financial analysis to examine various facets of an organization's financial performance.

• Comparative analysis focuses on evaluating a company's financial position by comparing it with similar enterprises in terms of industry type or other relevant characteristics. This comparison provides insights into the company's competitiveness and growth potential based on real external factors.

• Factor analysis aims to identify and quantify the influence of specific factors on the changes in the financial indicators being studied.

Table 1

Comparison of different approaches to economic and statistical analysis of the financial stability of a commercial organization

Advantages	Disadvantages
Traditional Approach	
Offers a holistic view of the financial health of an organization. This is the most commonly utilized method for determining financial stability.	It is highly resource-intensive. Some financial ratios are either too similar to each other or are inversely related. Methodologies involve varied sources of information. The importance of each ratio is contingent on the expertise of the analysts. There is often uncertainty in how the rating evaluations are interpreted.
Resource-Management Approach	
Focuses on organizations with vertically integrated structures. The approach is relatively low in terms of resource demands.	It heavily relies on the economic development model being used. It fails to account for factors such as production seasonality and other external variables.
Stochastic Analysis Approach	
Appropriate for organizations with integrated operations. Involves lower resource expenditure. Considers how well resources are managed and utilized.	|Dependent on the economic development model in use. It overlooks seasonality in production or other influencing factors.
Fuzzy Set Theory Approach	
Forecasts future financial stability levels. Assesses the probability of varying levels of financial sustainability.	Results can sometimes lead to conflicting evaluations. Continuous monitoring of the organization's financial health is necessary. Requires advanced mathematical skills for implementation.

To effectively implement these methods, it is crucial to establish a comprehensive information system. The development of a nation's economy is greatly influenced by the small business sector for several reasons:

- Small and medium-sized enterprises (SMEs) play a vital role in the economy. Unlike large corporations, SMEs are more adaptable and responsive to external changes. They can quickly adjust to economic shifts and fluctuations in product demand.
- SMEs are a significant source of income for many households, often providing a more stable and reliable tax base compared to large enterprises.
- Small businesses contribute significantly to technological advancements and innovative solutions, benefiting from government support through grants and subsidies.
- SMEs are essential in job creation, helping reduce unemployment rates. Their smaller teams foster a sense of unity, which boosts motivation and increases overall productivity.

For many individuals, small and medium-sized enterprises (SMEs) offer an incredible opportunity to find happiness, build a career, and realize their potential. However,

it's crucial to remember that these businesses need particular support and recognition from the state. Due to their ability to quickly respond to external changes, such businesses can experience significant fluctuations, such as a sudden increase in bank loans or a shift in consumer demand for their products. Such changes can trigger rapid growth, an alteration in the number of employees, or, in extreme cases, bankruptcy and other negative outcomes that can seriously affect the stability and success of small businesses.

The methodology for conducting an economic and statistical analysis of financial stability encompasses a set of indicators, both quantitative and qualitative, that enable a comprehensive evaluation of an enterprise's financial condition. These indicators, frequently recommended in both domestic and international economic literature, serve as a foundation for assessing the financial viability of an organization.

The indicators used in the economic and statistical analysis of financial stability can be broadly divided into two categories: absolute and specific indicators. Absolute indicators are typically expressed in monetary units, such as thousands of hryvnias, and are directly derived from accounting data or calculated based on balance sheet models. These indicators can be either the sum or difference of financial indicators reflected in the financial position of the organization.

Some key absolute indicators used in assessing financial stability include:

- Capital and reserves: This indicator reflects the amount of capital available to the company, showing the financial base on which the organization operates.
- Retained earnings: This reveals the accumulation of profits that have been reinvested into the business since its inception, showcasing the company's ability to generate profit over time.
- Long-term liabilities: This relates to the positional capital that can be allocated for long-term investments, providing insight into the organization's capacity to manage substantial capital for future growth.
- Short-term obligations: These liabilities indicate the company's need to create reserves and undertake activities related to short-term operations, often directly linked to daily business functions.
- Short-term funds attracted: The amount of short-term financing obtained for continued operations, helping to assess the business's reliance on external short-term capital.
- Net profit: This demonstrates the increase in retained earnings and provides insight into the company's profitability and overall financial health.
- Sales revenue: This reflects the company's potential for capital growth through its core business activities, providing an indicator of the enterprise's competitiveness and operational efficiency.
- Profit before subsidies: This showcases the company's capacity for generating profits at both primary and secondary business levels, before considering government subsidies or incentives.
- Difference between energy capital and fixed capital: This represents the energy capital lost due to long-term investments in fixed capital, offering an understanding of how invested funds are being utilized.
- Government capital and long-term capital: This refers to the total amount of long-term capital available for long-term investments, including contributions from the government, and is critical for planning future financial sustainability.
- Current assets: These reflect the organization's short-term assets and highlight the need for long-term financing to support current activities.

- Creation of reserves: These reserves, including working capital and short-term positional capital, provide insight into how well the organization manages its finances and interacts with customers for payments.
- Difference between working capital and reserves: This helps in identifying the nature of the company's financial stability, whether it leans towards conservative or more risky business strategies.
- Difference between reserves and provisions: Understanding this difference is key to evaluating financial stability, as it indicates the balance between funds set aside for unforeseen liabilities and actual financial needs.
- Level of capital or balance sheet profit: This is one of the most fundamental indicators, reflecting the organization's economic potential, its financial capabilities, and its ability to generate sufficient returns to sustain and grow the business.

Each of these absolute indicators provides a critical piece of the financial puzzle, enabling managers, investors, and policymakers to gain a clear picture of the organization's stability and its ability to weather financial challenges. The combination of these indicators, when assessed accurately and comprehensively, forms the foundation of a robust financial stability analysis, helping to ensure the ongoing success and growth of the enterprise.

The evaluation of financial stability relies on a variety of relevant indicators that provide insights into different aspects of an organization's financial health. These indicators help to understand how effectively the company is managing its capital, assets, and liabilities, which are critical in ensuring long-term sustainability. Below is an expanded explanation of these key financial stability indicators:

1. Degree of Autonomy: This indicator is determined by the size of the authorized capital, which shows the extent to which the organization is self-reliant in terms of funding. A higher degree of autonomy indicates that the organization is less dependent on external financing and has a stronger financial position.
2. Financial Independence Ratio: This ratio assesses the proportion of long-term and solid assets in the total capital structure. It highlights how much of the company's assets are financed by its own capital as opposed to debt or other external financing sources. A higher financial independence ratio reflects a more stable financial foundation.
3. Financing Ratio: This reflects the amount of capital available for each unit of demand. It helps to determine how well the organization can meet its operational needs with the resources it has at its disposal. This ratio plays a significant role in identifying the company's ability to finance its activities without overly relying on external funds.
4. Leverage Ratio: This ratio measures the amount of debt, or positional capital, the company carries for each unit of its financial resources. A high leverage ratio could indicate higher risk, as it suggests that a significant portion of the company's operations is financed through debt. Conversely, a lower ratio indicates that the organization relies more on its own capital.
5. Working Capital Ratio: This ratio indicates the proportion of current assets that are financed by a combination of equity and long-term debt. It gives a sense of how effectively the company manages its short-term financial obligations and whether it is relying on its equity or borrowed funds to support day-to-day operations.
6. Energy Capital Ratio: This ratio reflects the share of energy capital invested in current assets, specifically focusing on current operations. It gives insight into how much of the company's energy capital (which can include various types of long-term investments) is tied to short-term operational needs.

7. Fixed Assets to Public Financing Ratio: This ratio illustrates the extent to which fixed assets (e.g., property, plant, and equipment) are financed by public funds. It provides insight into how much of the company's long-term investments are supported by external, often government-backed, financing sources.

8. Fixed Assets to Equity and Long-Term Financing Ratio: This ratio measures the portion of fixed assets funded by equity shares and long-term financing. It helps to assess whether the company's long-term assets are primarily financed by its own funds or external debt, which can indicate financial stability.

9. Reserve Provision to Water Capital Ratio: This ratio shows how reserves are formed based on the share of water capital (liquid assets) and the impact of long-term investments in fixed assets. It's useful for assessing the adequacy of reserves to cover potential financial shortfalls.

10. Degree of Reserve Coverage: This indicator reflects the degree to which reserves are financed by different reserve management mechanisms, such as retained earnings or external funding. This metric helps to assess whether the company has sufficient financial buffers to withstand potential losses or unexpected expenses.

In addition to these core indicators, there are several supplementary metrics that can further refine the analysis of financial stability:

- Wealth to Assets Ratio: This indicator compares the company's wealth (the value of its assets and liabilities) to its total assets. It is an important metric for understanding how efficiently the organization is utilizing its assets to generate wealth.
- Real Estate Financing by Equity: This ratio shows the extent to which the company finances its real estate investments using its own equity capital. A higher ratio indicates a more stable financial position, as it suggests the company is not overly reliant on external debt for its long-term investments.

Analysis Process for Financial Stability:

To perform a thorough financial stability assessment, the following steps are typically undertaken:

1. Analysis of Total Capital Structure: This involves examining the structure and dynamics of the organization's total capital, including recommendations for optimal capital allocation between different units or sources of capital. A well-balanced capital structure is crucial for ensuring that the company can maintain financial stability during fluctuations in market conditions.

2. Examination of Attracted Capacities and Capital: This step focuses on analyzing the structure of borrowed capital and its relationship to the company's equity. The goal is to assess how well the organization manages its external financing in relation to its own funds.

3. Evaluation of Net Working Capital: The analysis of net working capital involves assessing the types and adequacy of working capital reserves that the company holds for its day-to-day operations. This is essential for maintaining liquidity and financial flexibility.

4. Reserve Formation and Its Role in Financing: This analysis focuses on the company's ability to form and manage reserves, which are vital for ensuring financial stability. Strong reserve management provides a buffer against unforeseen financial challenges.

5. Acceleration Coefficient: The acceleration coefficient is used in financial stability analysis to understand how rapidly the company's financial position is improving or deteriorating. This metric helps predict future financial trends and potential risks.

6. Analysis of Financial Results: Evaluating financial results helps to identify opportunities for capital growth. By examining profits, revenues, and expenses, the organization can find areas where capital can be better utilized or increased.

7. Effectiveness of Public Administration: Assessing the effectiveness of public administration and government policies is crucial for understanding how external economic factors impact financial stability. This includes analyzing asset liquidity and the company's ability to remain solvent despite external pressures.

8. Currency Stability Risk Assessment: Finally, the risk of losing currency stability is assessed. Currency fluctuations can significantly impact financial stability, especially for companies that engage in international trade or rely on foreign currency transactions.

By conducting these analyses and using the relevant indicators, organizations can gain a comprehensive understanding of their financial stability. This process provides valuable insights into their ability to withstand financial challenges, maintain liquidity, and pursue sustainable growth strategies.

Conclusions. Economic and statistical analysis of financial sustainability involves a comprehensive evaluation of an organization's ability to maintain financial independence and self-finance its activities, while also securing the necessary capital for pursuing its strategic objectives and long-term development. The concept of financial sustainability is inherently multifaceted and cannot be fully understood or assessed without delving deeply into the entire process of economic expansion, resource allocation, and financial management. This requires a thorough examination of the capital structure, as it directly impacts the organization's financial stability and growth potential.

In order to conduct a thorough analysis, it is necessary to first understand the sources of capital and how they contribute to the overall financial health of the organization. The capital structure of an entity consists of the mix of its debt and equity financing, and understanding the reasons behind the changes in this mix is crucial for assessing the stability and sustainability of its financial position. For example, a shift from equity financing to debt financing can signal an increased reliance on external creditors, which may raise concerns about the organization's long-term viability, especially in the face of economic downturns or market volatility.

In addition to evaluating the reasons behind changes in the capital structure, the analysis must also focus on identifying possible ways to renew or restructure the existing capital power dynamics. This is important because, as economic conditions evolve, the financial needs and strategies of an organization may change, requiring adjustments to the capital structure. For example, an organization that initially relied on debt financing may need to shift toward more equity-based funding if it experiences difficulties in meeting its debt obligations or if it seeks to reduce its financial risk exposure.

The process of updating the capital structure often involves considering a variety of factors, such as the cost of capital, the organization's risk tolerance, its growth potential, and its ability to service debt. Financial sustainability can be improved by balancing the proportion of debt and equity in a way that minimizes the cost of financing while maintaining an acceptable level of financial risk. Proper management of this balance is key to achieving long-term financial stability and ensuring that the organization has the resources necessary to pursue its strategic goals.

Another critical aspect of the analysis is the evaluation of the effectiveness of financial and government activities. This involves assessing how effectively the organization utilizes its financial resources and how external factors, such as government policies and market conditions, influence its financial stability. For instance, the role of government support programs, subsidies, or tax incentives can significantly impact the financial

sustainability of a business, particularly for small and medium-sized enterprises (SMEs). Understanding how these external factors affect the organization's financial health can help in identifying areas for improvement and optimizing the use of available resources.

Furthermore, the process of financial sustainability analysis should include a review of the organization's performance metrics, including liquidity, profitability, and solvency ratios. These financial indicators provide valuable insights into the organization's ability to generate cash flow, maintain profitability, and meet its long-term financial obligations. By analyzing these indicators, it becomes possible to gauge the organization's resilience to economic shocks and its capacity to remain financially viable in the long run.

In conclusion, the economic and statistical analysis of financial sustainability is an essential tool for understanding the dynamics of an organization's financial position. By examining the capital structure, evaluating the impact of government policies, and assessing key financial indicators, organizations can gain a clearer understanding of their financial health and make informed decisions about their future financial strategy. This comprehensive approach not only helps to assess the current state of financial sustainability but also provides valuable insights into how organizations can adapt to changing economic conditions and secure the necessary resources to achieve their strategic goals.

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