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ANALYSIS OF THE FINANCIAL LEVERAGE EFFECT OF A MANUFACTURING ENTERPRISE

АНАЛІЗ ЕФЕКТУ ФІНАНСОВОГО ВАЖЕЛЯ ВИРОБНИЧОГО ПІДПРИЄМСТВА

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The study's relevance is determined by the complex nature of the impact of borrowed funds on capital, which creates a need for a flexible and well-considered approach to managing financial resources. In particular, it is important to consider the balance between the potential increase in profit from borrowing funds and the rise in financial risks, which allows the enterprise to optimize the capital structure and ensure a balance between profitability and financial stability. In this context, a systematic study of the classical financial leverage mechanism plays an important role, enabling the analysis and planning of the volumes of equity and borrowed capital, considering the expected increase in profit. The study proves that using borrowed capital is a powerful tool that can impact the financial results of a manufacturing enterprise. However, its use is associated with certain risks. It is important to systematically analyze its impact and make informed decisions regarding the capital structure, considering the integrated effect of financial leverage.

Keywords: profitability, equity capital, financial resources, analysis, financial leverage mechanism.

Актуальність дослідження зумовлена складною природою впливу позикових коштів на капітал, яка формує потребу у гнучкому та зваженому підході до управління фінансовими ресурсами. Важливо враховувати співвідношення між потенційним приростом прибутку від залучення позикових коштів та збільшенням фінансових ризиків. Це дозволяє виробничому підприємству оптимізувати структуру капіталу та забезпечити баланс між його прибутковістю та фінансовою стійкістю. У цьому контексті важливу роль відіграє системне дослідження класичного механізму фінансового важеля, який дозволяє аналізувати та планувати обсяги власного і позикового капіталу з урахуванням очікуваного приросту прибутку. Доведено, що залучення позикового капіталу є потужним інструментом, який може вплинути на фінансові результати виробничого підприємства, якщо його використання не супроводжується вагомими ризиками. Тому важливо не лише системно аналізувати його вплив, але й приймати зважені рішення щодо структури капіталу, враховуючи інтегрований ефект фінансового важеля. Доведено, що дія механізму фінансового важеля формується через його аналітичні можливості, що є основою для ретельного планування дій з досягнення еталонного співвідношення між власним і позиковим капіталом. Еталонна структура капіталу здатна максимізувати прибутковість при збереженні прийнятної рівня фінансового ризику. Констатовано, що аналітична складова досягнення еталонного співвідношення між власним і позиковим капіталом є значущим процесом, що реалізується через оцінку поточної структури капіталу підприємства, порівняльний аналіз поточної структури капіталу з галузевими середніми значеннями та показниками конкурентів, аналіз фінансових ризиків, що пов'язані з поточною структурою капіталу, визначення найкращого співвідношення власного і позикового капіталу. Зазначено, що планова частина залежить від аналітичної і зосереджена на досягненні еталонного співвідношення між власним та позиковим капіталом через визначення цілей підприємства, які можуть вплинути на структуру капіталу, оцінку майбутніх фінансо-

вих потреб, вибір джерел фінансування цих потреб та розробку детального плану залучення капіталу. За особливостями аналізу та планування структури капіталу виробничого підприємства формується фокус на досягненні максимальної відповідності фактичної структури капіталу з її еталоном.

Ключові слова: рентабельність, власний капітал, фінансові ресурси, аналіз, механізм фінансового важеля.

Problem statement. In today's conditions of intensified competition and increasing economic instability, effective management of financial resources becomes critically important for the success of a manufacturing enterprise. One of the key tools ensuring such management is the inclusion of borrowed funds (debt) in the capital structure. The use of borrowed funds has a dual effect.

On one hand, it opens up broad opportunities for the manufacturer: the implementation of large-scale investment projects, expansion of production, and modernization of fixed assets, which in turn contributes to increased production volumes and enhanced competitiveness.

On the other hand, increasing the proportion of borrowed funds carries risks associated with higher financial costs in the form of interest on loans and other debt obligations.

This can negatively impact the financial stability of the enterprise, especially during periods of economic instability or declining profitability. Given the polarizing effect of borrowed funds, there is a need for a flexible and balanced approach to managing financial resources.

In particular, it is important to consider the balance between the potential increase in profit from borrowing funds and the rise in financial risks, which allows the enterprise to optimize the capital structure and ensure a balance between profitability and financial stability.

The analysis of recent researches and publications. The study of the effects of financial leverage has a rich history, shaped by the works of Sinitsin O.O., Kalinichenko Z.D., Kvasnitskaya R.S., Davidenko N.M., and others, who focused on the fundamental algorithms for assessing financial strength and operating leverage.

Modern algorithms for studying capital structure (through financial leverage) are examined by Demyanenko I. V. and Petryk S. V. At the same time, it is crucial to establish a general approach to determining the most effective mechanisms for utilizing borrowed capital and its impact on the financial profitability of enterprises.

In this context, a systematic study of the classical financial leverage mechanism plays an important role, as it allows for the analysis and

planning of equity and borrowed capital volumes, taking into account the expected increase in profit.

Goal setting (formulation of goals of the article). The study aims to examine the features of financial resource management in manufacturing enterprises through the classical analytical mechanism of financial leverage.

The paper main body with full reasoning of academic results. Managing financial resources in manufacturing enterprises through the classical financial leverage mechanism has several features influenced by the effect integrated into the capital structure of the enterprise [1–2].

Such an effect is a purely economic phenomenon, which involves the impact of the capital structure of a manufacturing enterprise (specifically, the ratio of equity to borrowed funds [4]) on the profitability of its equity capital (ROE).

This phenomenon creates opportunities for controlling and regulating this effect through a simple mechanism, allowing users to adjust profitability by changing the proportion of borrowed funds utilized.

The financial leverage mechanism of a manufacturing enterprise can be described through the following transformations of its capital:

1. The change in capital is due to the acquisition of borrowed funds. The manufacturing enterprise obtains a loan or issues bonds to attract borrowed capital.

2. The change is due to the investment of the acquired funds. The funds obtained by the manufacturing enterprise are directed towards financing investment projects, expanding production, modernizing fixed assets, acquiring assets, etc.

3. The change is due to earning profit. As a result of using the borrowed funds, the manufacturing enterprise generates profit from the sale of products or services.

4. The change is due to covering financial expenses. Part of the profit obtained by the manufacturing enterprise is used to cover financial costs associated with servicing the debt (such as interest payments, fees, etc.).

5. The change is due to the formation of net profit. Specifically, it involves the difference between the obtained profit and financial expenses, resulting in the net profit or loss of the manufacturing enterprise.

6. The change is due to the distribution of net profit or deduction of net loss. Net profit is distributed among the owners of the manufacturing enterprise (shareholders or proprietors) in the form of dividends or reinvested into the development of the enterprise.

In the case of a net loss, the enterprise has several options for covering it, such as using reserve capital, reducing equity, or utilizing retained earnings from previous years.

7. The change is due to the impact on return on equity (ROE). If the return on investment exceeds the weighted average cost of capital, which includes the cost of both equity and borrowed capital, then ROE increases (positive effect of financial leverage).

It means that the use of borrowed funds enhances enterprise profitability. Conversely, when the return on investment is lower than the weighted average cost of capital, ROE decreases (negative effect of financial leverage).

It means that the use of borrowed funds reduces profitability for the owners, as the cost of servicing the debt exceeds the profit obtained from the investments.

Thus, the effect of the financial leverage mechanism is shaped by its inherent analytical capabilities, which form the basis for careful planning of actions to achieve an optimal ratio between equity and borrowed capital.

It allows for the maximization of profitability while maintaining an acceptable level of financial risk.

In particular, the analytical component of achieving the optimal ratio between equity and borrowed capital is realized through [3; 7]:

1. Evaluate the current capital structure of the enterprise. It involves analyzing the equity-to-borrowed capital ratio, using indicators such as the financial dependence ratio, financial leverage ratio, and interest coverage ratio.

2. Compare the current capital structure with industry averages and competitors' benchmarks.

3. Analyze the financial risks linked to the current capital structure, such as insolvency risk, the risk of losing control over the business, and the risk of interest rate fluctuations.

4. Determining the optimal equity-to-borrowed capital ratio minimizes the cost of capital and maximizes the value of the business.

Thus, the diagram for analyzing the ratio between equity and borrowed capital in a manufacturing enterprise is shown in Figure 1.

The planning phase for achieving the optimal ratio between equity and borrowed capital is realized through:

1. Defining the enterprise's goals that may affect the capital structure.

2. Assessing the enterprise's future financial needs (including those related to investment projects, operational activities, and other requirements).

3. Choosing the source of financing for financial needs (considering their cost, availability, risks, and other factors).

4. Preparing a detailed capital acquisition plan specifies the amounts, timelines, and conditions for acquiring funds from various sources.

Thus, the diagram for planning the ratio between equity and borrowed capital in a manufacturing enterprise is shown in Figure 2.

In addition to the specifics of analyzing and planning the capital structure of a manufacturing enterprise outlined above, it is evident that there is a drive toward achieving maximum similarity with the benchmark capital structure. It is interpreted as the optimal ratio of equity to borrowed capital that minimizes the weighted average cost of capital (WACC) and maximizes the enterprise market value.

It is important to note that the optimal capital structure is determined by several criteria, including [6–7]:

1. Forming the financial stability of the manufacturing enterprise (for example, a well-chosen ratio of equity to borrowed capital provides the enterprise with adequate liquidity and solvency, reducing the risk of financial difficulties).

2. Determines the cost of capital, specifically allowing for the minimization of the weighted average cost of capital (WACC), which is a key factor in making investment decisions.

3. Provides financial flexibility, as it allows the enterprise to quickly respond to changes in market conditions and capitalize on new growth opportunities.

4. Enhances competitiveness, as it enables the minimization of production costs for innovative products.

According to the defined criteria, the optimal capital structure is not universal for all manufacturing enterprises and is not a static value.

Thus, the capital structure may vary depending on internal factors (such as the stage of the manufacturing enterprise's life cycle, overall

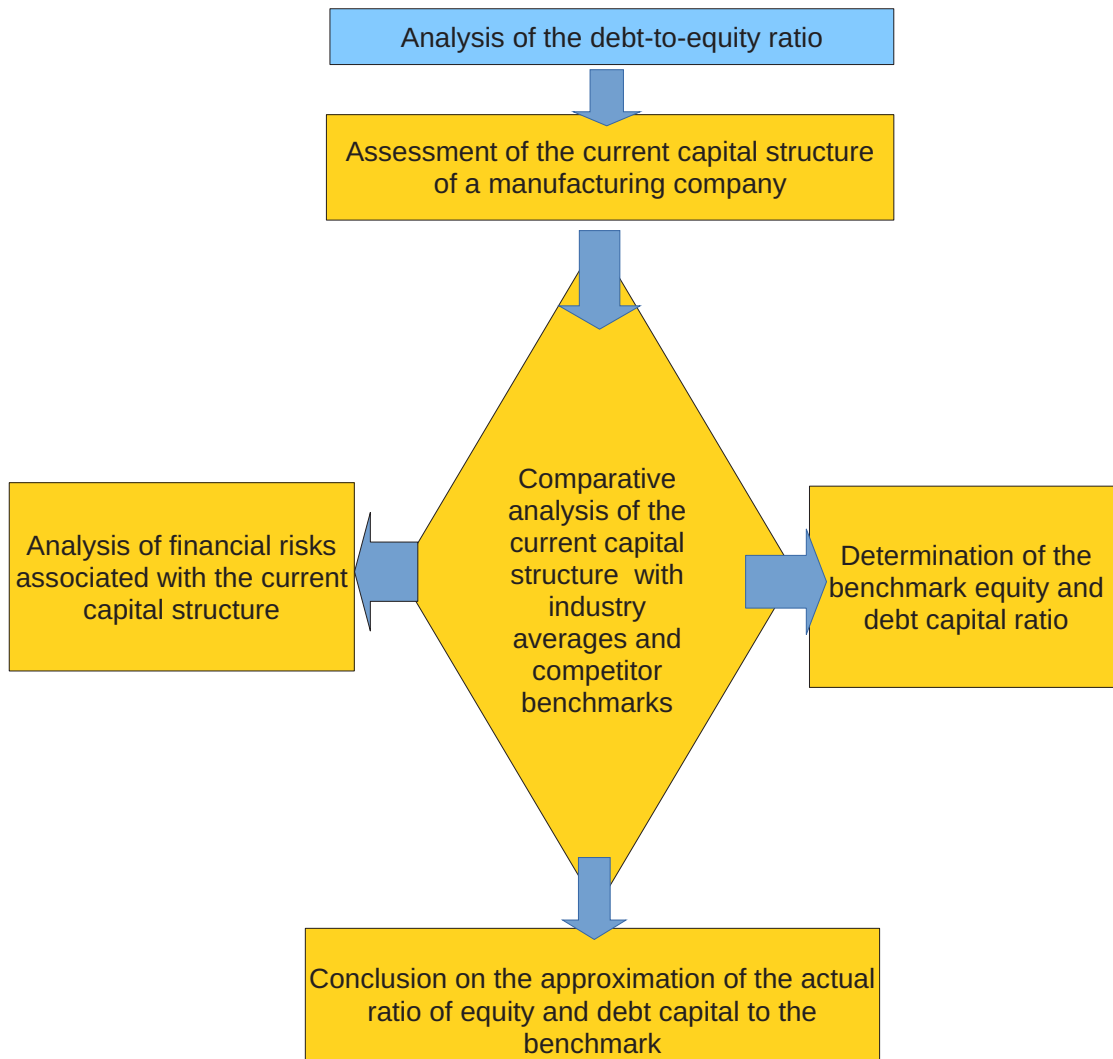


Figure 1. Diagram for analyzing the ratio between equity and borrowed capital in a manufacturing enterprise

Source: formulated by the author based on [1–2; 5–6]

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profitability, and business risk, dividend policy) and external factors (such as macroeconomic conditions, industry characteristics, tax legislation), the characteristics of which are presented in Table 1.

Given the dependence of capital on numerous internal and external factors, it is important for a manufacturing enterprise to regularly review and adjust its capital structure. However, this can be quite complex due to the numerous indicators involved, as it requires simultaneously considering changes in many factors.

To facilitate this task, a manufacturing enterprise can use a systematic approach focused on a single, most informative indicator – the financial leverage effect (FLE) of the enterprise. Various factor algorithms can be applied to this indicator, as emphasized in previous studies by

the authors [2]. Measuring and adjusting this effect should be the foundation of analyzing and planning the capital structure of a manufacturing enterprise.

Measuring and adjusting the financial leverage effect (FLE) can be accomplished through various methods, including those commonly used in financial analysis.

The first method considers the tax shield resulting from the deduction of interest on loans from taxable income, and thus uses a rather complex formula [1–3]:

$$FLE=(1-T)\times(Ra-C)\times(ED), \quad (1)$$

where:

T – tax rate on profit;

Ra – return on assets;

C – average cost of borrowing from external financing sources;

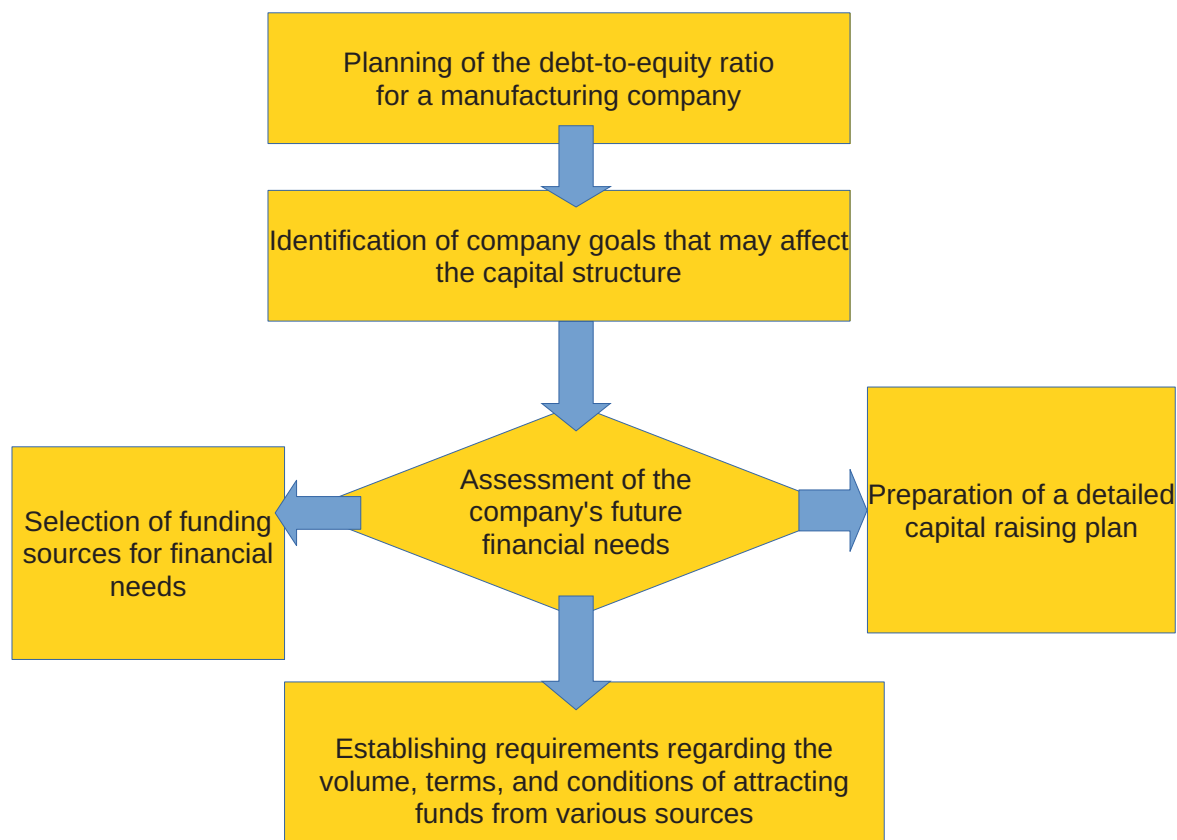


Figure 2. Diagram for planning the ratio between equity and borrowed capital in a manufacturing enterprise

Source: formulated by the author based on [1; 3; 6–7]

D – debt capital;
E – equity capital.

This algorithm measures how the return on equity changes based on the difference between the return on assets, the average interest rate on loans, as well as debt to equity ratio. Considering the outlined features, the advantages of this method include a precise and comprehensive approach to analyzing the Financial Leverage Effect (FLE), accounting for the impact of the tax shield, which is crucial for companies with high levels of debt, and the ability to assess the influence of various factors such as return on assets, cost of debt capital, and tax rates on the return on equity. The drawbacks of this method include the need for a significant amount of data for calculation, including the tax rate on profit and the average interest rate on loans, and complexity in interpretation, especially for individuals without deep knowledge in financial analysis.

The second method does not account for the tax shield and therefore uses a simplified formula [1–4]:

$$FLE = (ROE - ROA) / ROA, \quad (2)$$

where:

- **ROE** (Return on Equity) is the return on equity, i.e., net income divided by equity;
- **ROA** (Return on Assets) is the return on assets, i.e., net income divided by total assets.

This algorithm shows how much the return on equity (ROE) exceeds the return on assets (ROA), which can be interpreted as the additional profit gained through the borrowed capital use. Given the outlined characteristics, the advantages of this method are simplicity in calculation and interpretation, the absence of requirements for detailed information about taxes and loan rates, and the ability to quickly assess the impact of borrowed capital on return on equity. The disadvantages of this method are: ignoring the presence of a tax shield, which may lead to an underestimation of the financial leverage effect for companies with a high level of debt, and ignoring the difference between return on assets and the cost of borrowed capital, which may result in inaccurate conclusions about the optimal level of debt.

Table 1

Characteristics of factors influencing changes in the optimal capital structure of a manufacturing enterprise

Groups of Factors	Characteristics of factors' influence on the optimality of capital structure	Impact of factors on capital structure
Internal factors		
Stage of the life cycle	Fast-growing companies often rely more on equity, while mature companies with stable cash flows can afford to take on more debt	The optimal capital structure is not universal for all manufacturing enterprises
Profitability and business risk	Highly profitable companies with low risk can use more borrowed funds, while companies with high levels of risk need to be more cautious with debt	
Dividend policy	Companies that pay high dividends may have less available cash for servicing debt, so they might require a smaller proportion of borrowed funds.	
External factors		
Macroeconomic conditions	Interest rates, inflation levels, and the overall state of the economy can affect the cost and availability of various sources of financing	The optimal capital structure is not a static value
Industry characteristics	Capital-intensive industries, such as energy, utilities, telecommunications, and transportation, often have a higher proportion of debt in their capital structure.	
Tax legislation	Tax benefits on interest payments can make debt financing more attractive, thereby influencing the tax shield accordingly	
Regulatory requirements	Some industries may have restrictions on leverage levels, which affect the capital structure	

Source: formulated by the author based on [3–4]

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Characteristics of the features of the main methods for analyzing the financial leverage effect in manufacturing enterprises are presented in Table 2.

In addition to the aforementioned methods, there are other, less commonly used methods for calculating the financial leverage effect, which takes into account factors such as degree of financial leverage (DFL), debt ratio, interest coverage ratio, and others.

Each of these methods has its advantages and disadvantages, and their selection depends on the specific goals of the analysis.

All methods have their advantages and disadvantages, and none are absolutely precise. The choice of formula for calculating the FLE depends on the specific goals of the analysis and the available information. Thus:

1. When selecting a method for calculating FLE, one should consider the specifics of the enterprise, industry characteristics, and data availability.

2. It is important to remember that FLE is only one tool in financial analysis, and its results should be interpreted in light of other factors.

3. For a deeper understanding of the financial leverage effect, one can use both primary and additional analysis methods, such as Degree of Financial Leverage (DFL), debt ratio, interest coverage ratio, and others.

Conclusions. The study has proven that borrowed capital use is a powerful tool that can impact the financial results of a manufacturing enterprise. However, its use is associated with certain risks, so it is important to systematically analyze its impact and make informed decisions regarding the capital structure, taking into account the integrated effect of financial leverage. The following conclusions have been made:

The mechanism of financial leverage is shaped by its inherent analytical capabilities, which form the basis for careful planning of actions to achieve the benchmark ratio between equity and debt capital, enabling the maximization of

Table 2

Characteristics of the features of the main methods for analyzing the financial leverage effect in manufacturing enterprises

Basis for measuring the financial leverage effect	Algorithm action	Interpretation of the result	Choice of method
Algorithm 1 Considers the tax shield	Shows how much the return on equity exceeds the return on assets	<p>FLE > 0: The use of borrowed capital increases the return on equity (ROE). This means that the company earns more profit per unit of equity capital invested due to the use of borrowed funds.</p> <p>FLE = 0: Borrowed capital has no effect on ROE. The profit on equity capital does not depend on the use of loans.</p> <p>FLE < 0: Borrowed capital decreases ROE. The cost of servicing the debt exceeds the additional profit gained from using the borrowed funds.</p>	<p>For preliminary assessment or analysis of companies with low levels of debt, Algorithm 1 can be used.</p> <p>For detailed analysis and decision-making regarding capital structure, especially for companies with high levels of debt, it is recommended to use Algorithm 2</p>
Algorithm 2 Does not consider the tax shield	Measures how the return on equity changes based on the difference between return on assets and the average interest rate on loans, as well as the ratio of debt to equity. капіталу	<p>FLE > 0: The use of borrowed capital increases ROE, even after accounting for taxes. The company earns additional profit after taxes due to the loans.</p> <p>FLE = 0: Borrowed capital does not affect ROE after taxes.</p> <p>FLE < 0: Borrowed capital decreases ROE after taxes. The cost of servicing the debt exceeds the additional profit from using the loans, even with tax benefits.</p>	

Source: formulated by the author based on [2; 4-5; 7]

profitability while maintaining an acceptable level of financial risk.

The analytical component of achieving the benchmark ratio between equity and debt capital is the most significant process, which is realized through the assessment of the current capital structure of the enterprise, comparative analysis of the current capital structure with industry averages and competitors' indicators, analysis of financial risks associated with the current capital structure, and determination of the benchmark ratio between equity and debt capital.

The planning component is dependent on the analytical component. This dictates the focus on achieving the benchmark ratio between equity and debt capital. This process is realized by defining the enterprise's goals that may impact

the capital structure, assessing the future financial needs of the enterprise, choosing the source of financing for financial needs, and defining the contents of a detailed capital raising plan.

According to the defined features of capital structure analysis and planning, the focus of a manufacturing enterprise is on ensuring maximum alignment with the benchmark capital structure. In this process, specific methods for calculating the financial leverage effect should be the foundation.

Considering the above points, the obtained results create a basis for researching the effectiveness of using borrowed capital under different economic conditions, various stages of the enterprise life cycle, and levels of risk. This will help in developing recommendations for the use of borrowed funds under uncertainty.

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