

## ANALYSING THE RELATIONSHIP BETWEEN PROFITABILITY, LEVERAGE, AND BANKRUPTCY RISK: A COMPARATIVE STUDY OF DISTRESSED AND NON-DISTRESSED FIRMS

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### **Abstract**

*This study investigates the interrelationship between profitability indicators and leverage in the context of bankruptcy risk, based on data from Romanian small and medium-sized enterprises (SMEs) over the period 2021–2023. By analysing the gross profit margin ratio, return on assets (ROA), and the equity gearing ratio, the research aims to identify early warning signals of financial distress. The findings reveal clear distinctions between the two categories of firms—distressed and non-distressed—highlighting that a high level of leverage, when correlated with declining profitability, serves as a significant predictor of financial difficulties.*

*The combined analysis of these indicators proves more relevant in estimating bankruptcy risk, as interpreting them in isolation may provide an incomplete view of an entity’s financial health. Only by jointly assessing profitability and leverage levels can robust conclusions be drawn regarding financial vulnerabilities. This integrated approach enhances the early detection of economic difficulties, offering a practical tool for risk management and supporting firms in making preventive decisions aimed at forecasting bankruptcy risk and ensuring business continuity..*

**Keywords:** Bankruptcy risk; profitability; return; leverage

**JEL Classification :** G33, M41

### **1. Introduction**

In the economically uncertain environment of 2021–2023, marked by post-pandemic effects and rising inflation, the evaluation of financial performance has become essential for identifying early warning signs. Small and medium-sized enterprises (SMEs) in the manufacturing sector constitute a significant component of the Romanian economy; however, they are also particularly vulnerable to bankruptcy risk. Therefore, effective risk management is crucial to ensuring the continuity and sustainable development of these enterprises. Forecasting financial distress through the use of meaningful financial indicators enables the anticipation of difficulties and supports the formulation of appropriate strategic decisions.

### **2. Objectives**

This study undertakes a comparative assessment between financially sound enterprises and those experiencing financial distress, through the analysis of key financial indicators. These include profitability indicators—such as the gross profit margin ratio and return on assets (ROA)—as well as leverage indicators, specifically the equity gearing ratio.

The primary objective of the study is the early identification of bankruptcy risk through a comparative analysis of these significant indicators. The study aims to test the hypothesis that profitability and leverage metrics are not only relevant in describing a company’s financial position but also effective in providing early signals of its vulnerability to bankruptcy.

### 3. Literature Review

The concept of *profitability* is addressed—albeit to varying degrees—across the specialised literature. Where definitions are provided, there tends to be a general consensus.

*In Anglo-Saxon academic literature*, a clear distinction between “profitability” and “return” (or “rentability”) is not typically made. Within this tradition, the term “return” is subsumed under the broader concept of profitability, and the term “profitability” is employed even when referring to metrics that assess investment efficiency.

By contrast, *the continental European literature* draws a clear distinction between profitability ratios and return ratios. Colasse B. [1] defines return as “the ability of the enterprise, considered as an investment, to generate a result; it is measured by the ratio between that result and the investment represented by the enterprise.”

*In Romanian academic literature*, similar approaches to defining return are frequently encountered. These frameworks are primarily used to assess the economic soundness of an enterprise (e.g., profitability, efficiency), drawing upon data from financial statements, particularly the income statement.

Ștefea P. [2] argues that “return can only be discussed when the surplus realised by an investor is compared to the capital invested in a business.” From this perspective, the calculation of return ratios must begin with the investor’s motivation at the time of capital allocation—namely, the expectation of recovering the initial investment along with a surplus that justifies the investment decision. Thus, return is understood as the comparison between the profit (or surplus) generated and the resources invested—essentially a comparison of “effect” to “effort.”

According to Robu V. and Georgescu N. [3], return is defined as “the ability of an enterprise to generate profit through the utilisation of production factors and capital, regardless of their source. Return is one of the most synthetic expressions of the overall economic and financial efficiency of the enterprise, encompassing all production means and labour used across all stages of the economic cycle: procurement, production, and sales.”

A review of the literature concerning the analysis of an enterprise’s economic efficiency—measured in terms of profit relative to the resources employed—reveals that Anglo-Saxon and continental approaches converge to some extent on certain aspects. It is worth noting that, in this context, Romanian perspectives have traditionally aligned with continental frameworks.

Achim M.V. and Borlea S.N. [4] argue that return ratios serve a clearly defined purpose, namely “to highlight the efficiency with which investments made within the entity’s activities are utilised,” which is reflected in different ways:

- From the perspective of financial return (i.e. the efficiency of investments made by shareholders and long-term creditors, as represented by equity and/or employed capital);
- From the perspective of economic return (i.e. the efficiency of the investment represented by the resources controlled by the entity).

According to Siminică M. et al. [5], “return ratios are synthetic indicators used to measure the economic and financial performance of companies, expressing, in relative terms, their capacity to generate profit.”

In a more detailed approach, the clear distinctions between *the concepts of return and profitability* are defined by Achim M.V. and Borlea S.N. [4] as follows:

- “A state of profitability is a necessary condition for the existence of return in an economic activity”; thus, profitability can be considered a fundamental factor in establishing return;
- “Return ratios reflect the efficiency of an activity by relating financial *outcomes* to the *efforts* involved, whereas profitability ratios represent an *effect-to-effect* relationship (...).”

Assessing an entity’s performance in terms of its return is useful for accurately evaluating potential future changes in the economic resources the entity may control. Regarding a firm’s inclination toward leverage, performance analysis can provide insights into the likely impact of employing new financial resources.

Return ratios fall under the category of efficiency indicators; therefore, enterprise performance is also referred to as “yield,” which, according to Țilică E.V. and Ciobanu R. [6], measures “the financial outcome relative to the investment effort.”

Among the two main return indicators—namely, the return on assets (ROA) and return on equity (ROE)—this study focuses on the analysis of return on assets, as it more objectively reflects the efficiency with which a firm utilises its total resources and is more relevant in assessing bankruptcy risk. Furthermore, among the various expressions of *economic return*—such as return on assets, asset earning power, and return on expenditure—we have opted for the indicator that best captures overall economic performance.

*Return on assets* (ROA) expresses “the correlation between an economic outcome and the economic means (capital) committed to achieving it” [3]. This ratio may be calculated by dividing operating profit by total assets.

Return is a key condition for a firm’s success and long-term viability. The financial objectives of a company are significantly influenced by its ability to generate return.

As Botnari N. [7] states, return is essential because it influences economic growth, employment, and innovation through technological renewal. Without return and strategic resilience, a company would not be able to attract external capital, which would negatively impact the sustainability of its business life cycle.

The activities of any entity may give rise to risks and uncertainties. According to Mihai I. [8], in a general sense, *risk* is defined as “the variability of outcomes under the pressure of the external environment; more precisely, risk may be understood as the potential harm to which the assets, interests, and activities of an economic agent are exposed.” Manolescu Gh. [9] considers the notion of risk to be “inseparably linked to those of return and flexibility.”

Defining risk within the economic activity of an entity is particularly challenging due to the inherent subjectivity involved in its estimation, as well as the impossibility of quantifying it with complete precision.

As Siminică M. [10] observes, there are instances where the terms “risk” and “uncertainty” are used interchangeably, although clear distinctions exist between them: “uncertainty refers to not knowing what will happen in the future, whereas risk is the way we characterise how much uncertainty exists.”

The concept of risk has existed for a long time. Competition among economic agents has led to the emergence of the risk of failing to achieve established objectives and expected outcomes.

Thus, various types of risks may arise in the operations of an enterprise, the most significant being economic risk, financial risk, and bankruptcy risk.

According to Păvăloaia W. [11], *bankruptcy risk* is “determined by the insolvency of the firm, which refers to the enterprise’s inability to meet its maturing obligations—whether arising from previously contracted commitments, ongoing operations essential to business continuity, or mandatory payments.” As the author further states, the following characteristics of risk can be identified: “it represents a range of uncertainties; it constitutes the compensation for invested capital; it reflects a firm’s inability to adapt to environmental conditions; it signifies the probability of an undesirable event occurring; it is a measure of the firm’s vulnerability; it expresses the variability of outcomes under environmental pressure; it is a measure of the probability of success or failure; it has meaning only when an attempt is made to estimate possible fluctuations in return rates within the context of forecasting analyses.”

Paladi V. and Călugăreanu D. [12] argue in their study that “the assets required for conducting the economic and financial activities of an enterprise consist of two components: equity capital and borrowed capital, which differ fundamentally in terms of the financial expenses they generate.” According to the authors, leverage involves bearing financial costs related to debt repayment. The costs of debt cause fluctuations in financial results, amplifying both potential gains and losses.

Identifying the factors that influence the *leverage ratios* of enterprises within the Romanian economy is particularly important. As Gheorghe R.G. [13] states, the leverage effect is not only a factor that affects a firm's profitability, but also a significant source of financial risk.

Murray Z.F. and Vidhan K.G. [14] state in their study that the level of leverage is influenced by adverse selection, in line with the Pecking Order Theory of capital structure; that “leverage determines the cost of capital,” as described by the Trade-off Theory; and that indebtedness is closely associated with risk and the likelihood of bankruptcy, as explained by both the Trade-off Theory and the Agency Theory. Thus, debt and the leverage effect can function as mechanisms for managerial control.

According to Gheorghe R.G. [13], there are three theories that are particularly relevant for studying the capital structure of Romanian enterprises: the Pecking Order Theory, the Trade-off Theory, and the Agency Theory. When examined individually, these theories highlight the key determinants of an entity's capital structure.

In this study, the *leverage ratio* was calculated using the ratio of total liabilities to equity. This section provides a literature-based analysis of theories addressing the impact of leverage on financial stability and the associated risks—particularly bankruptcy risk.

Several studies indicate a consistent concern among enterprises in developed market economies with constructing an optimal financial structure aimed at maximising market value. The development of a specific financial structure is considered one of the most important aspects of a firm's financial policy, influenced by the company's strategic objectives, expected return levels, accepted risk exposure, interest rate fluctuations, inflation, and other macroeconomic factors.

Closely linked to the analysis of financial structure is the *leverage effect*. The leverage effect, also known as the gearing effect, refers to the profit gained by the entrepreneur through the use of bank loans to finance business operations. This effect is determined by comparing the firm's return on assets (ROA) to the interest rate on borrowed capital.

The comparison between the return on assets (ROA) and the interest rate on borrowed capital reflects the financial leverage effect. This is directly correlated with the firm's degree of leverage, expressed as the ratio of total liabilities to equity. When this ratio is high, it magnifies both the positive and negative impacts of indebtedness on the return on equity.

A *favourable scenario for the enterprise* arises when the return on assets exceeds the interest rate, indicating a *positive leverage effect*. Conversely, if the ROA is lower than the interest rate, *the leverage effect becomes negative*, reflecting that the entity is incurring losses and is unable to cover the interest expenses on borrowed capital.

Overall, choosing an optimal financial structure is essential for any entity, as it directly influences both the level of return and the risk of leverage.

In conclusion, the academic literature highlights the importance of correlating return and leverage ratios with bankruptcy risk, as these are critical elements in assessing the financial health of an enterprise.

The correlation between return on assets, leverage, and bankruptcy risk underscores the influence of capital structure on a firm's financial stability. The level of indebtedness has a direct impact on economic performance, and an increase in leverage—without a corresponding level of return—may indicate heightened vulnerability to financial risk. Therefore, analysing these indicators is essential not only for assessing a firm's financial position but, more importantly, for identifying early signs of imbalances that could escalate into imminent bankruptcy risk.

#### 4. Methodology

The enterprises included in the sample were divided into two categories:

- Distressed firms (experiencing financial difficulties);
- Non-distressed firms (financially sound).

The indicators analysed in the study are presented in the table below:

Table 1.1. Return vs. Leverage Indicators

Indicator	Calculation Formula
Gross Profit Margin Ratio	Gross Profit / Turnover × 100
Return on Assets (ROA)	Gross Profit / Total Assets × 100
Equity Gearing Ratio	Total Liabilities / Equity

Source: Author's own interpretation

Table 1.2. General Characteristics of the Evaluated Sample

Firm Category	Firm Code	Tax Status
Firms under the scope of Law 85/2014	F01 ... F07	Distressed Firms
Active firms	N-F08 ... N-F17	Non-distressed Firms

Source: Author's own interpretation

The table below presents the individual values of each enterprise for the three indicators analysed over the period **2021–2023**. These values constitute the empirical foundation for the interpretations and conclusions that follow.

For *gross profit margin*, the values are consistently positive. These enterprises apply effective pricing policies, with acquisition costs remaining lower than sales prices.

The level of *return on assets (ROA)* for these firms indicates that assets are being utilised efficiently. Based on the values recorded for each of the years analysed, these enterprises demonstrate a strong capacity to generate profit.

Regarding the *equity gearing ratio*, the relationship between equity and debt financing appears balanced among the non-distressed firms. Most values fall between 0.12 and 1.22, indicating that these enterprises rely predominantly on equity capital. Very few firms slightly exceed this range, yet even these cases remain within an acceptable threshold, maintaining solvency. There are no instances of significant over-leverage within this group—an aspect that contributes positively to the financial stability of these firms.

The following table presents the comparative averages of return and leverage indicators for both distressed and non-distressed enterprises, offering an overview of the performance differences between the two groups.

Tabel 1.5. Medii comparative între firmele falimentare și cele nefalimentare

Indicator	Average – Distressed Firms (F)			Average – Non-Distressed Firms (N-F)		
	2021	2022	2023	2021	2022	2023
<b>Return Ratios</b>						
Gross Profit Margin Ratio	-10,89	-8,19	-2,42	17,31	21,42	19,80
Return on Assets (ROA)	-2,76	-5,21	-5,42	27,01	28,73	22,01
<b>Leverage Ratio</b>						
Equity Gearing Ratio	-47,27	-3,68	-4,90	0,81	0,84	0,68

Source: Author's own results based on calculations performed on the analysed sample of firms.

## 5. Results and Discussion

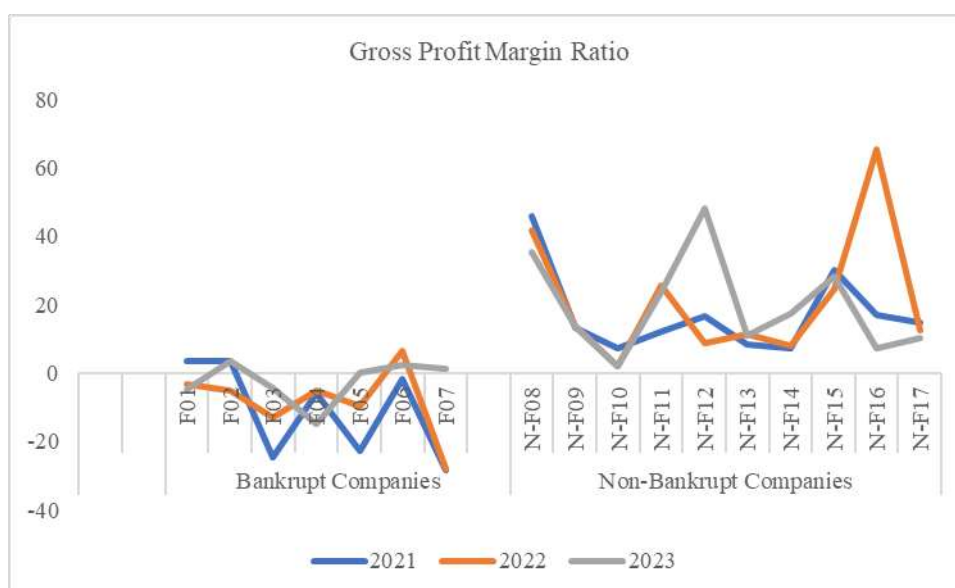


Figure 1.1. Evolution of Gross Profit Margin for the Two Groups of Firms (2021-2023)

Source: Author's own interpretation

Figure 1.1 highlights the contrast between distressed and non-distressed enterprises. Firms facing financial difficulties consistently record either negative or very low gross profit margins, indicating ineffective sales strategies and poor cost management.

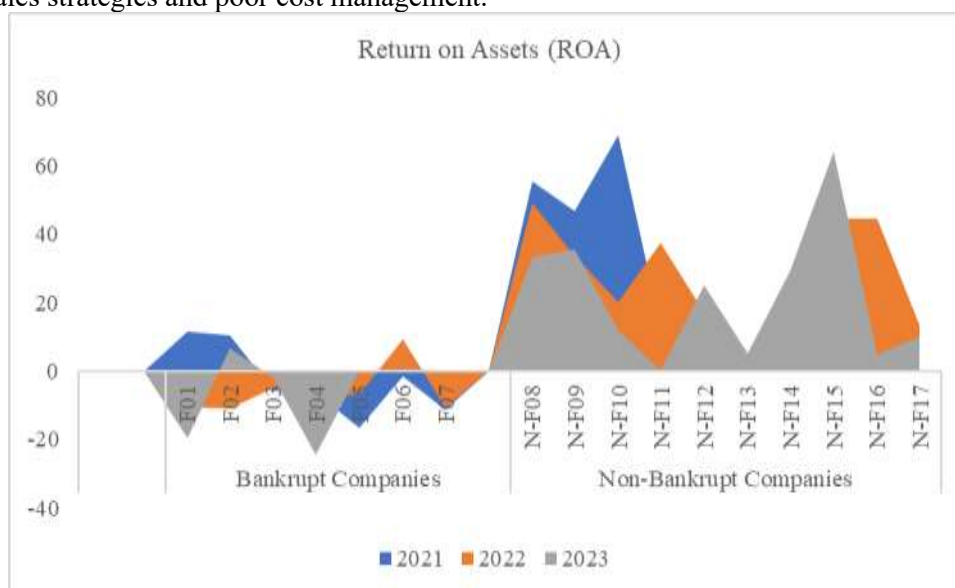


Figure 1.2. Evolution of Return on Assets (ROA) for the Two Groups of Firms (2021-2023)

Source: Author's own interpretation

As shown in Figure 1.2, throughout the entire period under review, distressed firms record predominantly negative return values in contrast to the comparator group. Meanwhile, all non-distressed firms maintain a positive trend in this indicator's values, reflecting the efficient use of assets.

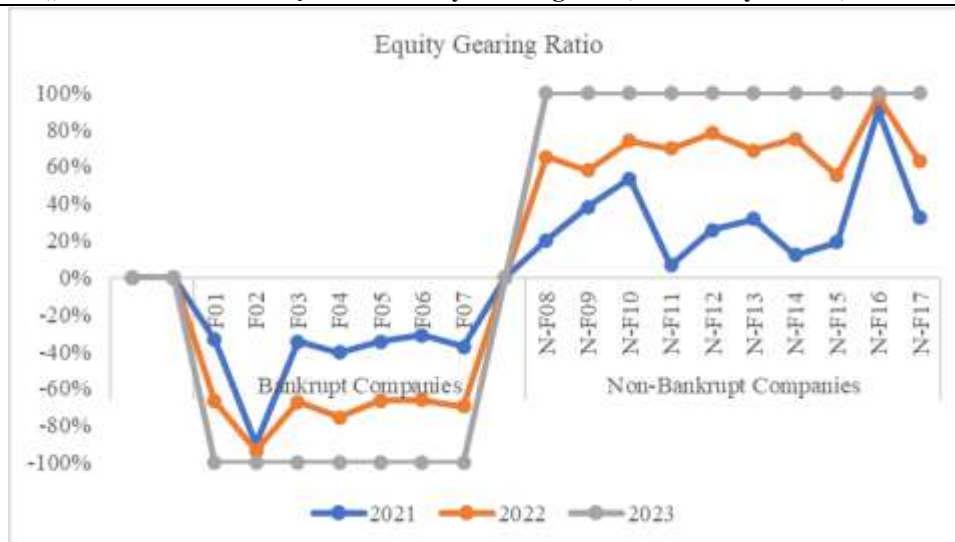


Figure 1.3. Evolution of Equity Gearing for the Two Groups of Firms (2021-2023)

Source: Author's own interpretation

In Figure 1.3, the results for the distressed firms show consistently negative values for this indicator, indicating excessive reliance on debt financing. In contrast, the non-distressed firms exhibit a more balanced financial structure.

The comparative analysis of the three indicators used in this study—Gross Profit Margin Ratio, Return on Assets (ROA), and Equity Gearing Ratio—reveals significant structural differences between distressed and non-distressed enterprises. These differences highlight the combined effects of weak commercial performance, low profitability, and high levels of leverage—a convergence of factors that increase the risk of bankruptcy.

The findings from the comparative analysis between distressed and non-distressed firms support the research hypothesis, demonstrating that the financial indicators analysed can serve as effective tools for the early identification of bankruptcy risk. The clear disparities observed in gross profit margins, economic returns, and leverage levels reinforce the argument that these indicators not only reflect a firm's financial position, but also function as early warning signs of potential financial instability.

## 6. Conclusions

This research confirms that the three financial indicators analysed—Gross Profit Margin Ratio, Return on Assets (ROA), and Equity Gearing Ratio—are significant tools for forecasting bankruptcy risk among small and medium-sized enterprises (SMEs) in Romania.

The results of the study demonstrate that a comparative analysis of these indicators reveals essential differences between distressed and non-distressed firms—differences that may serve as early warning signs of potential financial failure.

- ❖ The group of distressed enterprises is characterised by negative *gross profit margins*, indicating severe inefficiency in core business operations and an inability to generate profit from sales activities. In contrast, non-distressed enterprises consistently reported positive gross profit margins, reflecting healthy operational performance and more sustainable commercial strategies.
- ❖ Firms experiencing financial difficulties recorded low levels of *return on assets (ROA)*, reflecting inefficiency in using their assets to generate profit. In contrast, financially healthy firms exhibited satisfactory levels of economic return, indicating efficient utilisation of available resources.
- ❖ Another significant aspect in the analysis of the two groups is the *equity gearing ratio*, which was considerably high among distressed firms, exposing them to increased financial

risk and reducing their capacity for self-financing. By contrast, non-distressed firms rely more heavily on equity capital, maintaining a balanced financial structure and showing greater adaptability in the face of economic challenges.

Overall, the combined analysis of the three indicators provides a clear picture of an entity's risk profile. The presence of a negative gross profit margin, very low ROA, and high leverage may serve as an early warning signal of potential bankruptcy. Meanwhile, firms that maintain a balance between profitability and leverage, along with effective asset utilisation, are more likely to ensure long-term viability.

It is recommended that managers adopt proactive strategies to reduce bankruptcy risk among Romanian enterprises by continuously monitoring both profitability and leverage indicators. With the aid of these financial ratios, quick estimations of bankruptcy probability can be made for the firms they manage. Such analyses are valuable not only to managers but also to shareholders, credit institutions, and third parties interested in assessing a company's financial health.

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