Dmytrenko Y., Bushok K.,
students of master's degree in business management,
Ganushchak T.,
Associate Professor of the Department of Economics and Enterprise Finance
PhD in Economics
State University of Trade and Economics

FORMATION OF AN EARLY WARNING SYSTEM FOR THE BANKRUPTCY OF INDUSTRIAL ENTERPRISES

In contemporary economic conditions, industrial enterprises operate in an environment characterised by high uncertainty, rapid technological change, and intensifying global competition. These challenges have become even more significant after 2022 due to geopolitical instability, supply chain disruptions, and fluctuations in global markets. According to analytical reports from the National Bank of Ukraine, more than 30% of Ukrainian enterprises reported losses in 2022, while the industrial sector's profitability declined sharply due to rising production costs, energy shortages, and disrupted export routes. Therefore, the development of an effective early-warning system for bankruptcy is a crucial element of modern anti-crisis management. For industrial enterprises, early detection of potential problems provides an opportunity to implement restructuring measures, optimise costs, adjust production processes, and restore financial stability.

The concept of an early warning system for bankruptcy refers to a set of analytical tools and managerial procedures that allow companies to detect early symptoms of financial crisis. The primary objective of such a system is to provide management with timely information about possible threats to financial stability so that corrective actions can be taken before the situation becomes irreversible. Modern scientific research emphasises that the early detection of financial distress is based primarily on financial analysis and monitoring of key economic indicators: liquidity ratios, profitability indicators, solvency levels, and financial leverage ratios [1, 2].

In addition to traditional financial analysis, modern approaches to bankruptcy prediction often rely on econometric and statistical models. One of the most widely known models is the Altman Z-score model, which uses several financial ratios to estimate the probability of bankruptcy. Although the model was originally developed for American companies, it has been adapted and applied in many countries and industries. Research conducted in recent years indicates that predictive models can significantly improve the accuracy of bankruptcy forecasts when combined with industry-specific financial indicators and macroeconomic variables. Advanced analytical techniques, including machine learning and big data analysis, are also

increasingly used to improve prediction accuracy and identify hidden patterns in financial data [5].

The importance of early warning systems has become particularly evident for industrial enterprises operating in economies experiencing economic shocks. According to the State Statistics Service, the profitability of operating activities in the industrial sector decreased from 6.5% in 2021 to approximately 1.8% in 2023, indicating significant financial pressure on enterprises. Under such conditions, the implementation of early warning systems becomes essential for maintaining financial sustainability and preventing mass bankruptcies within the industrial sector [3].

Several Ukrainian enterprises demonstrate how proactive financial monitoring can help prevent crises. For instance, large industrial corporations such as ArcelorMittal Kryvyi Rih have implemented advanced risk management and financial monitoring systems that allow management to respond quickly to changes in global steel markets. During the recent global economic turbulence, the company adjusted its production volumes, optimised operational costs, and strengthened financial control mechanisms to maintain stability. Such measures illustrate the practical importance of early detection systems in industrial management. Apart from financial indicators, an effective early warning system should also include non-financial indicators related to operational efficiency and market conditions. For example, sudden changes in market demand, increasing production costs, supply chain disruptions, or declining labor productivity may indicate potential problems within the enterprise. Monitoring such indicators allows managers to identify risks at an early stage and develop appropriate strategies to mitigate their impact [4].

Another important element of bankruptcy prevention is the implementation of strategic management tools that enable companies to adapt to changing market environments. These tools include scenario planning, risk management frameworks, and strategic restructuring programs. For industrial enterprises, strategic flexibility is essential because production structures often require long-term investments and cannot be easily adjusted in response to market fluctuations. Therefore, companies must develop adaptive management systems capable of responding to external economic shocks [6].

Modern economic conditions, particularly after 2022, have demonstrated that companies must be able to identify potential financial threats at the earliest stages in order to maintain stability and competitiveness. Early warning systems based on financial monitoring, predictive models, and strategic risk analysis provide enterprises with valuable tools for detecting negative trends and preventing bankruptcy. In addition, the integration of digital technologies and advanced analytical methods increases the effectiveness of such systems and enhances decision-making processes. Therefore, the development and implementation of early warning systems should be

prioritised by industrial enterprises seeking to ensure long-term financial sustainability and resilience in a rapidly changing economic environment.

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Dmytrenko Y.,
Student of Master's Degree in Business Management,
Vavdijchyk I.,
Candidate of Economic Sciences, Associate Professor,
State University of Trade and Economics

PUBLIC AND PRIVATE INVESTMENTS IN THE DEVELOPMENT OF INNOVATIVE ENTREPRENEURSHIP IN UKRAINE

In the context of the contemporary knowledge-based economy, innovative entrepreneurship increasingly acts as a significant driver of economic development and technological advancement. For Ukraine, the development of innovative entrepreneurial activity is particularly relevant in light of ongoing economic transformation, the expansion of digital technologies, and the country’s gradual integration into global markets. Innovative enterprises typically require substantial financial resources during the early stages of development, as research and development activities are associated with high costs and considerable uncertainty regarding market outcomes. For this reason, both public and private investment play an essential role in supporting the functioning and long-term sustainability of national innovation ecosystems. The aim of this study is to examine the role of public and private investment in fostering the development of innovative entrepreneurship in Ukraine.