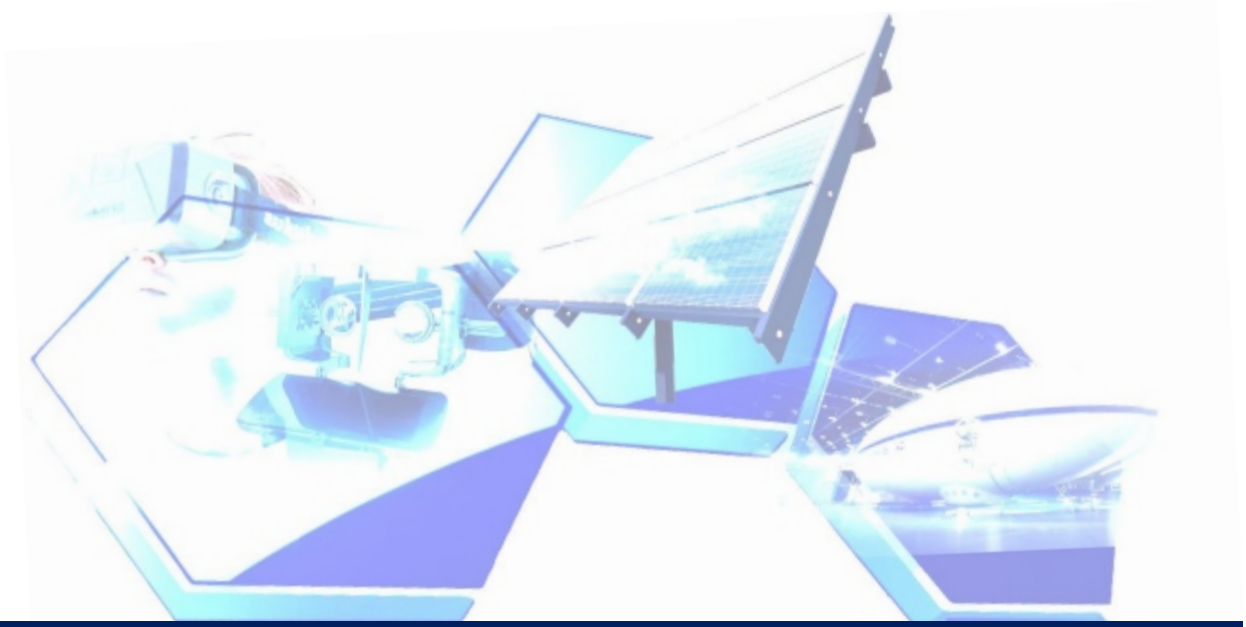
International scientific conference

ProConferenceOrg



International scientific publication

Future in the results of modern scientific research '2025

Conference proceedings

AUGUST '2025

Series Conference proceedings
SW-Ger conference proceedings

Published by:
Sergeieva&Co
Karlsruhe, Germany

https://www.proconference.org/index.php/gec/article/view/gec40-00-013
DOI: 10.30890/2709-1783.2025-40-00-013

UDC 330.4

OPTIMIZATION OF MEASURES TO INCREASE THE LIQUIDITY OF THE ENTERPRISE

Pistunov I.M.
d.t.s., prof.
ORCID: 0000-0002-9041-8368
Kravchenko O.Ya.
student
ORCID: 0009-0002-4060-1962
National Technical University "Dnipro Polytechnic University",
Dnipro, Yavornytsky Ave., 19, 49005

Abstract. *An economic and mathematical model was developed to identify key factors influencing the liquidity of the enterprise. Using correlation and other types of analysis, an assessment of the parameters and data system of the model of the influence of various factors on the general liquidity indicator of PJSC "KAMET-STEEL" was performed. For this purpose, certain factors of influence on the activities of the enterprise were selected, the nature of their dependence on the general liquidity indicator was determined, calculations were performed to identify the statistical reliability of the correlation coefficients using the Student`s criterion, factors were checked for multicollinearity and variables (X) were selected for further development of the mathematical model. In the process of calculations, the following factors (variables X) were determined for the following studies: X1 - inventories (thousand UAH); X2 - Production volumes of main types of products (thousand tons); X3 - Sales volumes of main types of products (thousand UAH); X7 - Price index of industrial products producers (%).*

A linear multifactor regression model was built with these variables. In these adverse economic conditions, the enterprise's activities have developed a situation where the volume of inventories and the volume of production of the main types of products have an inversely proportional relationship to the liquidity indicator, and the sales volumes of the main types of products and the price index of industrial products are directly proportional. This indicates a crisis situation of the enterprise and is confirmed by the lack of equity and the presence of uncovered losses in the financial statements for 2022. After checking the model using various calculation methods, it was proven that the model is adequate.

Based on the constructed model, a point forecast of optimistic, pessimistic and realistic scenarios of changes in the liquidity indicator under the influence of the influencing factors selected for the study was calculated, and it was checked using a confidence interval with a probability of 95%.

The final process of the study was the development and processing of a hypothesis for optimizing the liquidity of a metallurgical enterprise, and determining the economic effect of the developed methodology. After that, a number of recommendations were proposed for solving the issue of improving liquidity. It turned out that solving the issue of increasing the overall liquidity indicators of the enterprise and increasing the availability of its own funds is possible, primarily, by further increasing the volume of product sales, effective work with debtors, optimal use of the enterprise's inventories, and control of production volumes of the main types of products.

Key words: *liquidity, financial ratios, efficiency, analysis, financial condition, improvement, mathematical model, crisis.*

Introduction.

The issue of liquidity analysis is quite relevant for domestic enterprises in the

current challenging conditions: an unstable economic environment, increased global competition, inflationary fluctuations, disruptions in logistics chains, and growing financial risks. According to statistical data, most metallurgical enterprises in Ukraine have shown a decline in current and quick liquidity ratios since 2014, meaning they have problems with their ability to meet their obligations in a timely manner.

The situation with the absolute liquidity ratio proved to be particularly important, as it continued to fall even when other indicators stabilized. This is due to the significant historical events of 2014, namely the Revolution of Dignity, the annexation of Crimea, and the war in eastern Ukraine, which caused significant instability in the economic environment.

Particular attention should be paid to the structure of current assets, in particular the share of accounts receivable, as its excessive growth leads to the "freezing" of financial resources. According to the financial statements of the studied enterprise PJSC "KAMET-STAL," an increase in the share of overdue accounts receivable negatively correlates with the level of liquidity. This confirms the need to implement effective mechanisms for managing accounts receivable to prevent the loss of financial flexibility.

The results of calculations of general, quick, and absolute liquidity ratios indicate that in 2020–2022, the company gradually increased its financial potential but remained dependent on external factors and the market situation.

Main text

Microsoft Excel was used to build a system of variables and perform further calculations. Using correlation and regression analysis, this section examines the impact of various factors on the overall liquidity ratio of PJSC "KAMET-STAL."

The interpretation of the parameters obtained from the linear model is as follows:

$$Y_1 = 0{,}81413 - 1 * 10^{-7}X_1 - 0{,}0002X_2 + 9{,}2 * 10^{-9}X_3 + 0{,}40436X_7 \quad (1)$$

where Y1 is the total liquidity ratio, X1 is the company's inventory, in thousands of hryvnia, X2 is the production volume of main products, in thousands of tons, X3 is the sales volume of main products, in thousands of hryvnia, and X7 is the industrial

producer price index (%).

All other data proved to be statistically unreliable.

Based on the data below, certain factors influencing the company's activities were selected. In order to improve financial performance and financial results, it is recommended that a number of production and economic measures be taken for the next period of the company's activities. It is advisable for the metallurgical plant to:

✓ Reduce inventories by 21.2%. The combination of production inventories and work in progress ensures continuity of production at the enterprise, but storing excess inventories increases the enterprise's overall costs. Therefore, eliminating excess inventories of materials will increase the efficiency of working capital utilization, improve the financial condition of the enterprise, and increase the overall liquidity ratio. Reducing inventories of finished products and goods through their sale increases sales revenue, which in turn also increases the overall liquidity ratio.

✓ Reduce the production volume of main products from 1,652 thousand tons to 1,227 thousand tons, i.e., by 25.7%. Since the company's products are export-oriented, and during the martial law in Ukraine there are incredible problems with logistics, in addition, there are trade restrictions on international markets for Ukrainian metal products and anti-dumping duties, the company accumulates excessive stocks of unsold products. And when actual production volumes significantly exceed sales volumes, working capital is “frozen,” circulation costs increase, and as a result, the company's financial condition deteriorates and liquidity decreases.

✓ Increase sales of main products by UAH 1.097 billion, or 3.1%. Increasing sales of main products is one of the most important factors for profit growth, and in turn, a guarantee of improving the company's liquidity. Measures in this regard should include both finding new partners and sales markets, as well as actively working with existing partners to collect accounts receivable.

✓ The value of the constructed model for optimizing the overall liquidity indicator lies in its realism in the difficult conditions of a metallurgical enterprise's operations, and it is aimed primarily at overcoming the crisis situation of the

organization. Once the enterprise reaches at least the break-even point (zero loss), the optimization model will change. For now, the proposed method of improving liquidity according to the calculated model is a feasible and optimal option in the current real conditions.

Summary and conclusions.

The parameters and data system of the model of the influence of various factors on the overall liquidity ratio of PJSC "KAMET-STAL" were obtained and evaluated using correlation and other types of analysis. Then, a linear multifactor regression model was constructed and verified using various calculation methods. Based on the model, the forecast values of optimistic, pessimistic, and realistic scenarios of changes in the liquidity ratio under the influence of the factors selected for the study were calculated, and the forecast was verified using a confidence interval with a probability of 95%. In the course of the study, a hypothesis on optimizing the liquidity of a metallurgical enterprise was developed and elaborated, the economic effect of the developed methodology was proven, and a number of recommendations for improving liquidity were proposed.

The practical application of the proposed methodology of predictive and factor analysis will allow for preventive control and, therefore, influence the resulting indicators, regulating their level in accordance with the needs of the metallurgical enterprise and making informed management decisions, and as a result, bringing the enterprise out of crisis. This is the main value of the developed economic and mathematical model for optimizing the overall liquidity indicator of this thesis in difficult economic conditions, both for the enterprise and for the state.

sent: 22.08.2025