

Scientific-Practical Approach to Forming the Spatial Layout of Enterprises

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ABSTRACT

Objective: This study aims to develop a scientifically grounded methodology for assessing and managing the economic potential of manufacturing enterprises undergoing structural, technological, and institutional transformations. **Method:** The research employs the principal component method and correlation-regression analysis to identify key indicators reflecting the structural transformation process. Empirical data from multiple enterprises over five years were analyzed using SPStatistics to construct correlation matrices and reduce variables to the most informative set. **Results:** Factor analysis revealed that the receivables-to-payables ratio and capital autonomy exert the most significant influence on overall economic potential. These indicators enable enterprise managers to make data-driven decisions, enhance structural efficiency, and improve competitiveness. **Novelty:** The study introduces an adaptive and comprehensive approach that integrates modern quantitative techniques into a practical framework for evaluating and managing economic potential. This methodology facilitates simplification of complex economic assessments and supports strategic adaptation, including digital transformation, in a dynamic economic environment.

INTRODUCTION

Everyone in the enterprise business processes continuous structural changes and to them adaptation processes with related to. Enterprises own in front of placed strategic goals only their structural and organizational changes economic of potential relevant level provides and there is economic of the environment change and requirements adapted just by chance activity to show and done increase possible. Structural and organizational to changes to be placed requirements enterprise from within to resources was need [1], [2], economic interests provision, modernization to changes was need and enterprise value increase waiting both in form and externally and digitization processes, competition, technological innovations, new legislation and social of factors pressure in appearance comes. Available economic potential because of enterprises extreme important financial even in the circumstances, the crisis processes negative the impact prevent to take for systematic integrated changes done increases and flexible and harmonized shifts provide for preventive in a way changes done increases possible [3].

This approach basis application variables number reduce them classification and this components between correlation coefficients package and to the size and economic to potential impact doer adaptive-adaptive transformations in the fields elementary to the characteristics looking at structural parts to determine providing main components method is considered [4], [5], [6].

Analysis and results. The analysis of the structure of the economic potential of manufacturing enterprises conducted in the study made it possible to identify the following blocks of indicators: – restructuring and modernization; – market reproduction; – competence-functional; – innovative-intellectual. Each component is characterized by a certain set of statistical indicators. Since the economic potential of manufacturing enterprises is characterized by a large number of indicators, the analysis of which is a very complex and time-consuming process, it is recommended to summarize information representing many initial signs through smaller internal characteristics [7]. It is assumed that the most capacious characteristics have the most generalizing properties at the same time. To form a reduced set of indicators, we select the most informative variables from the initial set - representatives of blocks that play a decisive role in the formation of the corresponding integral indicator of the economic potential of manufacturing enterprises [8], [9]. The principal component method was used to select indicators for the analyzed blocks, which allows us to move from describing certain measured characteristics to describing them with a smaller number of maximally informative variables reflecting the most important features of the economic potential of production indicators [10], [11], [12], [13]. Based on the initial indicators, a correlation matrix of factors influencing the component of structural transformation and modernization of the economic potential of enterprises was calculated using the SPStatistics software package (Table 1).

We note that the general indicator of the assessment of the structural transformation and modernization component of economic potential is associated with many factors [14], [15], [16], [17], [18]. The values of the coefficients x_3 and x_6 are less than 0.2. Therefore, these factors can be excluded from further research due to their weak correlation with the resulting indicator.

RESEARCH METHOD

To assess and manage the economic potential of industrial enterprises under structural and adaptive transformation, this study employs a quantitative analytical approach based on principal component analysis and correlation-regression modeling. The methodology involved analyzing a multivariate dataset spanning five years from selected manufacturing enterprises. Key economic indicators—such as autonomy coefficient, own capital turnover ratio, capital coverage coefficient, and receivables-to-payables ratio—were collected and standardized. Using SPStatistics software, a correlation matrix was constructed to identify interdependencies among the indicators and to eliminate variables with weak explanatory power (correlation < 0.2). Factor analysis was then performed to condense the dataset into principal components representing the most impactful variables influencing structural modernization. Two primary components were extracted, together accounting for over 80% of the total variance. Weighted coefficients were calculated to build a composite index of economic potential, enabling strategic evaluation of enterprise efficiency under restructuring conditions. This methodological framework provides a robust basis for guiding decision-

makers in enhancing competitiveness through adaptive transformation and resource optimization.

RESULTS AND DISCUSSION

Table 1. Correlation matrix of factors influencing the structural transformation and modernization component of the economic potential of enterprises

Indicators	x 1	x2	x3	x4	x5	x6
x 1	1					
x2	0.429147	1				
X3	0.697786	0.196135	1			
X4	0.697053	0.767015	0.496252	1		
X5	-0.4738	-0.9912 -	-0.22875	-0.7527	1	
X6	0.27668	0.269713	0.34894	0.43154	-0.27229	1

Taking into account the results of the correlation analysis, we consider it necessary to conduct a factor analysis of the system of indicators, which will allow us to reduce their number and assess the impact of each factor on the structural structure and modernization component of the integral indicator of economic potential assessment in the context of structural, organizational and adaptive-adaptation changes.(Table 1)

The values of standardized indicators characterizing the structural transformation and modernization component of the economic potential of enterprises of the relevant clusters are presented in Table 2.

Table 2. Normalized values of indicators of the component of reconstruction and modernization of the economic potential of industrial enterprises

Variables	Autonomy coefficient, x1	Own capital turnover ratio, x2	Turnover capital cover coefficient, x4	Accounts receivable / accounts payable debts ratio, x5
1	2	3	4	5
A company				
2020	0.882411	0.093702	0.815113	0.917179
2021	0.856223	0.075137	0.810498	0.905161
2022	0.8	0.068290	0.808712	0.899898
2023	0.758759	0.056452	0.80714	0.893518
2024	0.736842	0.050438	0.805296	0.90187
Company B				
2020	0.0 24501	0.04 459 8	0.799 329	0.89 4389
2021	0.052 263	0.0 548 0 1	0.7 6941 7	0.91 6791
2022	0.0 24510	0.04 15 08	0.79 9475	0.9 21291
2023	0.04 12 05 1	0.041 8 0 5	0.79 1674	0.9 1 3 21 7
2024	0.0 1241 05	0.045 92 9	0.79 8721	0.9 40582

Home to components transition for we correlation matrix to oneself typical values (Table 3).

Table 3. Correlation matrix for typical values

Home components	Private values	General % of variance
1	2.2 161	0.5 405
2	1.0 932	0.2 735
3	0.5 389	0.1 374
4	0.1 536	0.0 341

Attention give (Table 3) first and second main components (factors 1, 2) common 82% of the changes explains. Variables and main between components (factors) relationship descriptive correlation matrix typical vectors (Table 4).

Table 4. Correlation matrix typical vectors

Factors	F1	F2
x 1	0.725	-0, 372
x2	0, 255	-0, 10 8
x4	0.36 6	0, 907
x5	0, 2 12	0.9 85
Private values , lj	2.2 0 6 1	1, 2084
Factor Weight , %	55.4 2	2 4 , 36

First component indicators of the collection general dispersion added the first has a share of 55.40 %, the second - 24.36%. Both component together general 81.13 % of the changes explains, this and factorization high level shows. Home of factors elementary variables with dependence determine the following conclusions release possible [19], [20], [21], [22]. F1 component following indicators own inside gets : autonomy coefficient (x1), own funds management coefficient (x2), own turnover funds with provision coefficient (x4) Second component F2 receivables and creditor debts ratio (x5) like indicator with is described [23], [24], [25], [26]. If the general dispersion unity as can if we are, this components every one of contribution approximately 0.60 and 0.40 will be. This values components weight coefficients as to take This is possible. of burdens control the sum is $0.6 + 0.4 = 1$.

Weight coefficients by the formula a_{ij} is :

$$a_{ij} = \frac{c_{ij}|d_{ij}|}{\sum c_{ij}|d_{ij}|} \quad (1)$$

this on the ground :

d_{ij} – factor downloads ;

c_{ij} – jth component i-characteristics indicators of the collection general to dispersion added contribution. Weight coefficients calculation 5 - in the table cited.

Tables 5. Weight factors calculation

Indicators	F1	F2	0.6	0.4	Weight
x 1	0.752		0.703		0.481
x2	0.254		0.361		0.392
X4	0.648		0.382		0.317
X5		0.978		1	0.3

Indicators	F1	F2	0.6	0.4	Weight
Total	1,654	0.978	1,446	1	1.49

The general indicator of the component of the reconstruction and modernization of the economic potential of the UIS (TQ), which is a component of the integral indicator of the assessment of economic potential in the conditions of structural and organizational and adaptive and harmonizing changes of industrial enterprises, is determined by the formula (2):

$$I_{UIS(TQ)} = 0,481 * x_1 + 0,392 * x_2 + 0,317 * x_4 + 0,3 * x_5 \quad (2)$$

The impact of the components on the overall indicator of the structural restructuring and modernization of economic potential can be explained as follows: the greatest impact on the overall indicator is the ratio of receivables to payables, with its increase by 1%, the overall indicator increases by 40.0%, an increase in the ratio of own working capital by 1.0% leads to an increase in the overall indicator by 1.0%. Maneuvering own funds by 1.0% contributes to an increase in the overall indicator by 19.3%, an increase in the autonomy coefficient by 1.0% allows you to increase the overall indicator by 18.4%.

CONCLUSION

Fundamental Finding : This study highlights that economic potential functions as a strategic resource, necessitating its integration into enterprise-level strategic planning. By employing principal component analysis and correlation-regression methods, a comprehensive and integral indicator of economic potential was developed, enabling a multidimensional understanding of an enterprise's structural and adaptive capabilities.

Implication : The application of this methodology facilitates informed decision-making, identification of performance bottlenecks, inter-enterprise benchmarking, and the formulation of strategic responses to enhance competitiveness through structural and organizational transformation. It supports the implementation of adaptive, flexible, and innovation-driven management strategies aligned with current economic dynamics.

Limitation : The study's reliance on quantitative indicators may overlook qualitative factors such as managerial behavior, cultural dimensions, and industry-specific dynamics, potentially limiting the generalizability of findings across different sectors.

Future Research : Further studies should explore the integration of qualitative dimensions into the assessment framework and test the methodology's applicability across diverse economic contexts, including digital and service-oriented enterprises, to enhance its robustness and practical relevance.

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