SOCIO-ECONOMIC CHALLENGES

Proceedings
of the International Scientific and Practical Conference

(Sumy, March 22-23, 2021)

330.3:005(063)
S62

Editor-in-Chief
Prof., Dr. ***Vasilyeva Tetyana***, Director of Academic and Research Institute of Business, Economics and Management, Sumy State University

Approved by the Academic Council of Sumy State University
(protocol № 5, 12 June 2021)

S62
Socio-Economic Challenges : Proceedings of the International Scientific and Practical Conference, Sumy, March 22–23, 2021 / edited by Prof., Dr. Vasilyeva Tetyana. – Sumy : Sumy State University, 2021. – 287 p.

Proceedings of the International Scientific and Practical Conference "Socio-Economic Challenges" are devoted to finding a systemic solution to multidisciplinary problems in the field of modern development, management, administration of various systems, corporate social responsibility, innovation management in various fields of environmental management.
For scientists, scientists, students, graduate students, representatives of business and public organizations and higher education institutions and a wide range of readers.

330.3:005(063)

EVALUATING THE EFFECTIVENESS OF AN ENTERPRISE' EXPORT-IMPORT ACTIVITY

Lyudmyla Malyarets, D.Sc., Prof.
Simon Kuznets Kharkiv National University of Economics, Ukraine
Vitaliia Koibichuk, PhD, As. Prof.
*Sumy State University, Ukraine*

The leading indicators of the economic development of the country are the advantage of exports of goods over imports, and the intensity of this development depends on the ratio of exports and imports for some time. Among modern concepts of measuring efficiency at the enterprise level more popular such as comprehensive data analysis, which features a large information base to describe efficiency, and hence the complexity of calculation (Abeysekera, 2020; Abolfazl Akhondzadeh, 2019; Khan, 2018; N. S. M. Ahmad et al., 2018); measuring the achievements of the service enterprise, which pays more attention to the types of enterprises in the field of service and services (Pavlyk, 2020); the concept of the achievement measurement model, which provides for the selection of key indicators for management and the process of continuous improvement of units (Huo et al., 2020; Yiu et al., 2020; Bublyk et al., 2017); the concept of the internal market Hewlett-Packard, which provides for the implementation of technology to assess the effectiveness of activities (Kasztelnik, 2020; Singh, 2019; Adeyinka et al., 2019; Al. K. Chakrawal et al., 2018).

Analysis of these concepts shows the following: in almost all definitions, efficiency is a coefficient that characterizes the degree of return on investment; efficiency must have both quantitative certainty and qualitative; efficiency should be perceived as a vector that indicates the direction of development and growth of the enterprise; in the ratio of the components of the efficiency of the enterprise there are several approaches, namely: results and costs (efficiency), results and goals (feasibility), result and needs (profitability) (Tovmasyan et al, 2020; Vasylieva et al., 2018; Lyulyov et al, 2017).

Evaluation of the effectiveness of an export-import activity was made on the indicators of the large industrial enterprise PJSC «Turboatom» (Ukraine). Guided by the requirements for the criteria and analysis of well-known scientists and practitioners on economics and management of the enterprise showed the feasibility of considering a system of partial efficiency criteria in the following composition: export efficiency ratio (x_1), import efficiency ratio (x_2), overdue liabilities ratio (x_3), the share of exports in the total sales of the enterprise (x_4), the profitability of sales (x_5) (Waluyo et al., 2016; Yarovenko et al., 2020; Ministry for Development of Economy, Trade and Agriculture in Ukraine). These indicators were measured during the 2010 – 2018 years. To diagnose the effectiveness of export-import activities according to these criteria at the enterprise the value must be converted taking into account both the numerical characteristics of distribution laws and patterns of development of this activity (Fig. 1). There are many approaches to this procedure, namely standardization, normalization by various formulas. Given the obvious advantages of the modified logistics conversion function:

$$y_{ij} = \frac{1}{1+e^{-3\frac{x_{ij}-p_i}{q_i-p_i}}}, \qquad (1)$$

where q_i – the value of the indicator x_{ij}, at which the conversion function takes a value not less than 0,95; p_i – the value of the indicator x_{ij}, at which the conversion function becomes 0,5 (Us et al, 2018). It should be noted here that the level of the converted values of the criterion depends on the establishment of q_i and p_i.
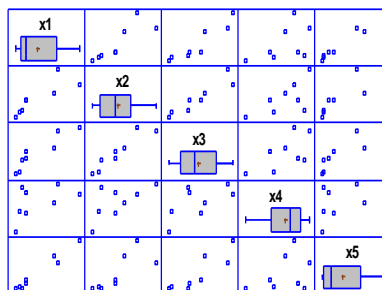
Fig. 1. The Box and Whisker Plot for the indicators of the effectiveness of an export-import activity of PJSC "Turboatom"
Source: developed by the authors with Statgraphics Centurion tools

Transformed values by the formula (1) can be compared with each other; are on a scale from 0 to 1; can be used in further mathematical calculations. An important function of diagnosing the effectiveness of export-import activities of the enterprise is to predict the development of its features and analysis of scenarios for this development.

To predict the features of the enterprise's export-import activities efficiency, its level and the level of

structural dynamics, it is advisable to calculate models of growth curves, which are presented as a function of time, given that the influence of other factors is insignificant or indirectly taken into account due to time. The statistical quality of the constructed models of growth curves for the forecast is determined by the criteria of checking the quality of the constructed regression models: the coefficient of determination (R^2), the Fisher criterion (F), the Darbin-Watson criterion (DW). The existence of autocorrelation of residues can significantly distort the predictive values, so if the Darbin-Watson test confirms the existence of autocorrelation of residues in the model, such a model shouldn't be used to calculate the forecast. Using the statistical package Statgraphics Centurion, models for forecasting the values of the criteria of efficiency of export-import activity of the enterprise PJSC «Turboatom» were calculated on the basis of growth curves (Table 1).

Table 1.

Models and values of the forecast of criteria of export-import activity efficiency

Forecasting models	Statistical criteria	Predictive values of criteria
$x_1 = \dfrac{1}{0,836 + 0,061\ln t}$	$R^2 = 0,542$, $F = 8,28$, $DW = 1,921$	1,024; 1,0179; 1,01245
$x_2 = \sqrt{1,318 - 0,142\ln t}$	$R^2 = 0,986$, $F = 486,02$, $DW = 2,021$	0,9957; 0,9889; 0,9827
$x_3 = \dfrac{1}{4,242 + 0,078t^2}$	$R^2 = 0,963$, $F = 184,42$, $DW = 2,08$	0,0832; 0,0733; 0,0648
$x_4 = \exp^{-0,342 - 0,007t^2}$	$R^2 = 0,514$, $F = 7,39$, $DW = 1,95$	0,3404; 0,2917; 0,2464
$x_5 = \dfrac{1}{-0,007 + 0,03t}$	$R^2 = 0,884$, $F = 52,93$, $DW = 1,78$	36,4292; 36,1103; 35,8457

Source: developed by the authors

Statistical criteria indicate that the calculated models are suitable for forecasting the criteria. According to the forecast values of indicators of efficiency of export-import activity, we see the decreasing all values, and it is a bad tendency. The enterprise should urgently develop a program of action. Only a decrease in overdue liabilities is a good trend. One of the important diagnosis stages is the formation of reference values of diagnostic criteria and assessment and analysis of the state of the object based on the comparison of the achieved values of the criteria with the standards (Dove, 2020; Miller, 2019; Levchenko et al., 2018; Musa et al., 2017). If there are no legally proposed normative values of criteria, it's recommended to be based on optimal and predictive ones to form their relevant values.

References

Abeysekera, R. (2020). Exploring Factors Affecting the Effectiveness of Business Training in the Microfinance Sector: Using the Industrial Marketing Purchasing (IMP) Approach. Business Ethics and Leadership, 4(3), 46-56. https://doi.org/10.21272/bel.4(3).46-56.2020

Abolfazl Akhondzadeh (2019). The Analysis of the Factors Affecting the Implementation of Virtual R&D in Iranian Tile and Ceramic Companies Using Structural Equation Modeling Approach. SocioEconomic Challenges, 3(4), 86-96. http://doi.org/10.21272/sec.3(4).86-96.2019.

Adeyinka, Ad. J., Abdulkarim, M., Odi, N. (2019). Implications of Development Bank Finance on the Growth and Development of Msmes in Nigeria (2010-2017). Financial Markets, Institutions and Risks, 3(3), 28-48. http://doi.org/10.21272/fmir.3(3).28-48.2019.

Al. K. Chakrawal, P. Goyal. (2018). Performance Measurement and Management in Public Enterprises in India: A Case Study of NTPC. Financial Markets, Institutions and Risks, 2(3), 28-37. DOI: 10.21272/fmir.2(3).28-37.2018.

Bublyk, M., Koval, V., & Redkva, O. (2017). Analysis impact of the structural competition preconditions for ensuring economic security of the machine building complex. Marketing and Management of Innovations, (4), 229 - 240, http://doi.org/10.21272/mmi.2017.4-20

Dove, M., Balasubramanian, A., Narayanan, B.G. (2020). Transparency As A Way Of Attaining Quality, Safety And Optimal Food Purchases. SocioEconomic Challenges, 4(4), 48-62. https://doi.org/10.21272/sec.4(4).48-62.2020

Huo, Y., & Kristjánsson, K. (2020). An Explorative Study of Virtues in Ethical Consumption from a Confucian Perspective in an Urban-Rural-Fringe in China. Business Ethics and Leadership, 4(4), 105-122. https://doi.org/10.21272/bel.4(4).105-122.2020

Kasztelnik, K. (2020). Causal-Comparative Macroeconomic Behavioral Study: International Corporate Financial Transfer Pricing in the United States. Financial Markets, Institutions and Risks, 4(1), 60-75. http://doi.org/10.21272/fmir.4(1).60-75.2020.

Kendiukhov, I., & Tvaronaviciene, M. (2017). Managing innovations in sustainable economic growth. Marketing and Management of Innovations, 3, 33-42. http://doi.org/10.21272/mmi.2017.3-03.

Khan, Md Yusuf Hossein (2018). The Effectiveness of Entrepreneurial Activities for Economic Development: A Route to Innovation and Job Generation. SocioEconomic Challenges, 2(2), 32-40. DOI: 10.21272/sec.2(2).32-40.2018

Levchenko, V., Kobzieva, T., Boiko, A., & Shlapko, T. (2018). Innovations in Assessing the Efficiency of the Instruments for the National Economy De-Shadowing: the State Management Aspect. Marketing and Management of Innovations, 4, 361-371. http://doi.org/10.21272/mmi.2018.4-31

Lyulyov, O. V., & Pimonenko, T. V. (2017). Lotka-Volterra model as an instrument of the investment and innovative processes stability analysis. Marketing and Management of Innovations, (1), 159-169. http://doi.org/10.21272/mmi.2017.1-14

Miller, A.D. (2019). Current Mining Taxation Policy Implemented by both Mongolia and Kazakhstan: The Development Comparatives between Ulaanbaatar and Astana. Business Ethics and Leadership, 3(2), 39-52. http://doi.org/10.21272/bel.3(2).39-52.2019

Ministry for Development of Economy, Trade and Agriculture in Ukraine: official web-site. Available at: http://me.gov.ua (accessed: 22 May 2019).

Musa H., Musova Z., Sliacky P. (2017). Financial Support to Small and Medium-Sized Enterprises in Slovakia. Financial Markets, Institutions and Risks, 1(4), 47-52. DOI: 10.21272/fmir.1(4).47-52.2017

N. S. M. Ahmad, Mr. R. Ah. A. Atniesha. (2018). The Pecking Order Theory and Start-up Financing of Small and Medium Enterprises: Insight into Available Literature in the Libyan Context. Financial Markets, Institutions and Risks, 2(4), 5-12. DOI: http://doi.org/10.21272/fmir.2(4).5-12.2018

Pavlyk, V. (2020). Institutional Determinants Of Assessing Energy Efficiency Gaps In The National Economy. SocioEconomic Challenges, 4(1), 122-128. http://doi.org/10.21272/sec.4(1).122-128.2020.

Singh, S.N. (2019). Impact of Value Added Tax on Business Enterprises: A Case of Mettu Town. Financial Markets, Institutions and Risks, 3(4), 62-73. http://doi.org/10.21272/fmir.3(4).62-73.2019.

Tovmasyan, G., Minasyan, D. (2020). The Impact of Motivation on Work Efficiency for Both Employers and Employees also During COVID-19 Pandemic: Case Study from Armenia. Business Ethics and Leadership, 4(3), 25-35. https://doi.org/10.21272/bel.4(3).25-35.2020

Us, H., Malyarets, L., Chudaieva, I., & Martynova, O. (2018). Multi-Criteria Optimization of the Balanced Scorecard for the Enterprise's Activity Evaluation: Management Tool for Business-Innovations. Marketing and Management of Innovations, 3. 48-58. http://doi.org/10.21272/mmi.2018.3-04

Vasylieva, T., Harust, Yu., Vynnychenko, N., & Vysochyna, A. (2018). Optimization of the financial decentralization level as an instrument for the country's innovative economic development regulation. Marketing and Management of Innovations, 4, 381-390. http://doi.org/10.21272/mmi.2018.4-33

Waluyo M., Huda S., Soetjipto N., Sumiaty & Huato (2016). Analysis of Balance Scorecards Model Performance and Perspective Strategy Synergized by SEM. MATEC Web of Conferences 58, 02003. 1-8. http://doi.org/10.1051/matecconf/20165802003.

Yarovenko, H., Kuzmenko, O., Stumpo, M. (2020). DEA-Analysis Of The Effectiveness Of The Country's Information Security System. SocioEconomic Challenges, 4(3), 142-153. https://doi.org/10.21272/sec.4(3).142-153.2020

Yiu, L., Saner, R., Bardy, R. (2020). Collective Action on Public Goods for Sustainable Development: Ethics in Action. Business Ethics and Leadership, 4(4), 14-27. https://doi.org/10.21272/bel.4(4).14-27.2020