DOI: 10.55643/fcaptp.4.51.2023.4121

Svitlana Smerichevska
D.Sc. in Economics, Professor of the Department of Logistics, National Aviation University, Kyiv, Ukraine;
ORCID: 0000-0003-0733-8525

Zarina Poberezhna
D.Sc. in Economics, Associate Professor of the Department of Economics and Business Technologies, National Aviation University, Kyiv, Ukraine;
e-mail: zarina_www@ukr.net
ORCID: 0000-0001-6245-038X
(Corresponding author)

Oleksii Mykhalchenko
Candidate of Economy Sciences, Associate Professor, First Vice-Rector, National Aviation University, Kyiv, Ukraine;
ORCID: 0000-0002-3389-9361

Yuliia Shtyk
Candidate of Economy Sciences, Associate Professor of the Department of Economics and Business Technologies, National Aviation University, Kyiv, Ukraine;
ORCID: 0000-0002-3988-6641

Yurii Pokanevych
Candidate of Economy Sciences, Associate Professor of the Department of Economics and Business Technologies, National Aviation University, Kyiv, Ukraine;
ORCID: 0000-0001-6360-7190

Received: 26/07/2023
Accepted: 30/08/2023
Published: 31/08/2023

MODELING AND EVALUATION OF ORGANIZATIONAL AND ECONOMIC SUPPORT FOR SUSTAINABLE DEVELOPMENT OF TRANSPORT ENTERPRISES: INNOVATIVE AND ECOLOGICAL ASPECTS

ABSTRACT

The main purpose of the article is to form a conceptual model of organizational and economic support and to assess the sustainable development of transport enterprises. It is scientifically substantiated and proven that the formation of the sustainable development of the enterprise depends on the identification and systematization of factors that affect it, the development of a dynamic model and its evaluation. A system of organizational and economic support for the sustainable development of the enterprise is proposed, which is presented taking into account the main components, such as: economic, socio-legal, ecological and innovative, which contribute to the efficiency of the enterprise's functioning, increasing its profitability, thereby ensuring a dynamic balance on the market. The research used methods of analysis, expert evaluations, methods of deduction and induction, methods of systematization, and abstract methods. Updated directions and practical recommendations for managing the sustainable development of a transport enterprise. The proposed model for assessing the sustainable development of a transport enterprise, allows you to optimize its activities, identify existing opportunities for development, as well as ways to increase the level of development in the future, which, unlike others, allows for a comprehensive and comprehensive assessment of the current level of sustainable development. The model for assessing the sustainable development of a transport enterprise consists in the definition and assessment of sustainable development indices, it was established that the most significant component forming sustainable development is economic (with a weighting factor λ_1=0,38), the second place is occupied by social and legal (with a weighting factor λ_2=0,24), and the third is environmental (with a weighting factor λ_3=0,21). At the same time, the innovative component exerts a formative influence on both the three above-mentioned components and acts as an independent variable in the formation of the integral indicator of sustainable development (with a weighting factor of λ_4=0,17). The use of the proposed model for determining the level of sustainable development of transport enterprises allows to focus the attention of enterprise managers on developing measures to increase the efficiency of operations and minimize the impact of the external environment when conducting business activities.

Keywords: modelling, evaluation, organizational and economic support, transport enterprises, sustainable development, components of sustainable development, innovative development, environmental impact

JEL Classification: L91, Q56, C52, O4, O3

INTRODUCTION

In the context of globalization and transformational changes that lead to uneven market development, enterprises face processes of environmental uncertainty and inconsistency in the realization of the needs and interests of various market participants. Sustainable and dynamic development of enterprises contributes to the country's international competitiveness, GDP growth and solving many social problems. The operation

of enterprises on the basis of sustainable development ensures employment and increase of incomes of the population, production of innovative and technological goods, development of knowledge and professional skills to meet social needs, growth of production scale, introduction of innovations and know-how at all stages of the enterprise's operation. Increasing the scale of production has a negative impact on the environment, which in turn worsens its condition, causing global ecological and humanitarian problems. This leads to the search for new ways to regulate the economic activities of enterprises from the standpoint of innovation, environmental safety and social responsibility. It is in these conditions that the issue of organizational and economic support for the sustainable development of enterprises becomes extremely important since the efficiency of functioning and competitiveness of the transport enterprises depends on their economic development.

The development and subsequent transition to the concept of sustainable development of transport enterprises is a priority task that is gaining particular relevance, and the effective implementation of sustainable development models allows for achieving better results in various areas: economic, ecological, social and innovative etc.

LITERATURE REVIEW

Many foreign and domestic scientists have studied the issues of sustainable development, such as M. Bernardo [1], F. Figge [2], S. Wagenhals [3], N. Vasyutkina [4], T. Vetsko [5], A. Burda [6], A. Kuznyetsova [7, 16], C.Mio [14], J. Alvarez [15], A. Calabrese [17] and others.

Thus, according to authors [1-6; 14; 16; 17], sustainable development of an enterprise is defined as the presence of sustainable development potential, the local components of which ensure a consistent, balanced, harmonious development of the socio-economic system, and, through adaptability and flexibility, its effective use to neutralize external destabilizing factors and threats created by the competitive environment without risk to the life of the enterprise [1-6; 14; 17]. A. Kuznyetsova considers sustainable development of an enterprise as a purposeful and continuous development aimed at creating long-term value by balancing financial and non-financial goals, efficient use of available resources (capital), implementation of the concept of corporate social responsibility and use of opportunities and management of risks arising from economic, social and environmental development [7]. The study of organizational and economic support of enterprises in the context of sustainable development was carried out by such scholars as L. Dovgan [8], M. Shashina [9], L. Marshuk [10], V. Makhinko [11], A. Fleming [18], R. Hahn [19], T. Hak [20].

According to L.E. Dovgan [8], organizational and economic support for the functioning of enterprises is defined as "a system of forming goals and incentives that allow transforming the movement (dynamics) of material and spiritual needs of society members in the process of labour activity into the movement of means of production and its final results aimed at meeting the effective demand of consumers". Organizational and economic support of the enterprise's functioning is a system of forming goals and incentives for the subject's activity. According to M.V. Shashina [9], organizational and economic support is based on "trends in the development of the enterprise, takes into account the achieved scientific and technical level of its development, social, legal and psychological relations in the team of the enterprise in the management process". The researcher identifies the components of organizational and economic support, in particular, pays attention to the legal aspect.

L.M. Marshuk [10] considers the organizational and economic support of an enterprise as "a set of measures and means, creation of conditions that facilitate the course of economic processes, implementation of plans, programs, projects, etc.", emphasizing the relationship between organizational and economic support and the realization of the enterprise's goal.

V.Y. Makhinko [11] understands the organizational and economic support of enterprise development only as "the management process to achieve the goal of development by implementing a system of enterprise goals as a result of the use of its resources".

The analysis of the authors' publications suggests that despite the high scientific and practical value, there is a need to model and evaluate the organizational and economic support for sustainable development of transport enterprises in the context of aspects of innovative development and environmental safety.

AIMS AND OBJECTIVES

The main purpose of the article is to form a conceptual model of organizational and economic support and to assess the sustainable development of transport enterprises. The object of research is the system of organizational and economic support for the sustainable development of transport enterprises. The main task of the article is to model ways to improve

the efficiency of transport enterprise management, develop a conceptual model in the field of organizational and economic support for the sustainable development of transport enterprises and formulate measures for enterprise management from the perspective of innovation and ecological components.

METHODS

The research methodology consists of general scientific methods that allowed to generalize theoretical provisions on organizational and economic support of sustainable development of transport enterprises and formulate conclusions; methods of analysis, expert assessments, methods of deduction and induction, methods of systematization and abstract methods. All of these methods were used to determine the list and weight of the indices of sustainable development of the transport enterprise, as well as to analyze the activities and conditions of enterprises. Graphical methods were used to build graphs and create a mathematical model for determining the indices of sustainable development.

RESULTS

The process of managing the activities of enterprises and ensuring the sustainability of their development is based on the mobilization of all its resources and the assessment of its own potential capabilities. One of the urgent tasks for managers of enterprises is the formation of organizational and economic support for sustainable development, which makes it possible to effectively manage and increase the level of competitiveness of the enterprise.

In the context of digital business transformation and fierce competition, the success of an enterprise depends on many factors, where innovation is a special factor that harmonizes the impact of all groups of factors that affect the enterprise, providing opportunities to solve business problems. The slightest innovative advantage over competitors can play a decisive role in the effective management of the enterprise and ensure its sustainable development [12; 13; 21; 22].

The basis of sustainable development of enterprises is a combination of its main components, such as: economic, social, ecological and innovative, that is, the well-known three-component model of sustainable development of an enterprise should be supplemented with the fourth component - innovative. The economic component of sustainable development of enterprises includes financial resources, their distribution and the state of use, which ensure the development of enterprises on the basis of profit growth and solvency in the face of changes in the external environment. The social component of sustainable development is focused on improving living standards and working conditions by raising wages and staff qualifications. Ecological sustainability includes the use of modern production technologies, labour automation and the use of environmentally friendly materials that help reduce the negative impact on the environment by eliminating the use of harmful substances and reducing electricity consumption. The current economic environment is characterized by intensification and globalization of human impact on the environment. And, while in the past humanity experienced regional and local environmental crises, the current situation threatens global environmental collapse, as humans are destroying the basic mechanisms of the biosphere's functioning on a global scale. Ecosystem services also play an important role in sustainable development, because they are free goods provided by nature and ecosystems. They have economic, social and ecological value. Conservation and sustainable management of ecosystems is a necessary condition for ensuring sustainable development. Integrating ecosystem services into business management, decision-making and policy development helps preserve valuable natural resources and ensure long-term economic and social development. This approach promotes balanced development that does not harm the environment, but, on the contrary, contributes to its renewal and preservation for future generations.

Thus, the analysis of socio-environmental issues shows that economic development cannot be separated from environmental problems, as environmental degradation is a serious obstacle to economic development.

The environmental activities and ecosystem services of an enterprise should be aimed at implementing a sustainable development strategy through the integration of all economic entities - producers (of goods and services), suppliers of raw materials and components, trading and logistics companies, consumers, society and other stakeholders involved in the promotion of goods on the market, ensuring success in competition, as well as the formation and functioning of organizations and structures for environmental protection.

The innovation component is systemic, as the introduction of innovations directly affects the economic, social and environmental components of sustainable development. There is a two-way relationship between innovation and sustainable development. On the one hand, economic, social, and environmental factors improve as a result of intensified innovation. On the other hand, these improvements lead to the accumulation of funds, knowledge and skills to spread innovation

DOI: 10.55643/fcaptp.4.51.2023.4121

processes in the country. The introduction of innovations at enterprises helps to reduce production costs, increase labour productivity, increase profits and profitability of enterprises, and improve product quality. At the macro level, the intensification of innovation activity leads to the creation of new sectors of the economy, GDP growth and national competitiveness, budget revenues, and an increase in the share of innovative products in general and in national exports in particular [22].

Management of sustainable development of the enterprise involves the formation of organizational and economic support aimed at achieving the goals, functions, principles and methods of enterprise management, and contributes to the continuity of socio-economic processes of improving the efficiency of the enterprise, increasing its profitability, thereby ensuring a dynamic balance in the market (Figure 1):

The system of organizational and economic support for the sustainable development of an enterprise is formed under the influence of the most important factors of economic growth, which are aimed at restructuring the internal business processes of the enterprise in combination with an appropriate response to external challenges. This will allow the enterprise to adapt to changing socioeconomic conditions, political situations, and international challenges.

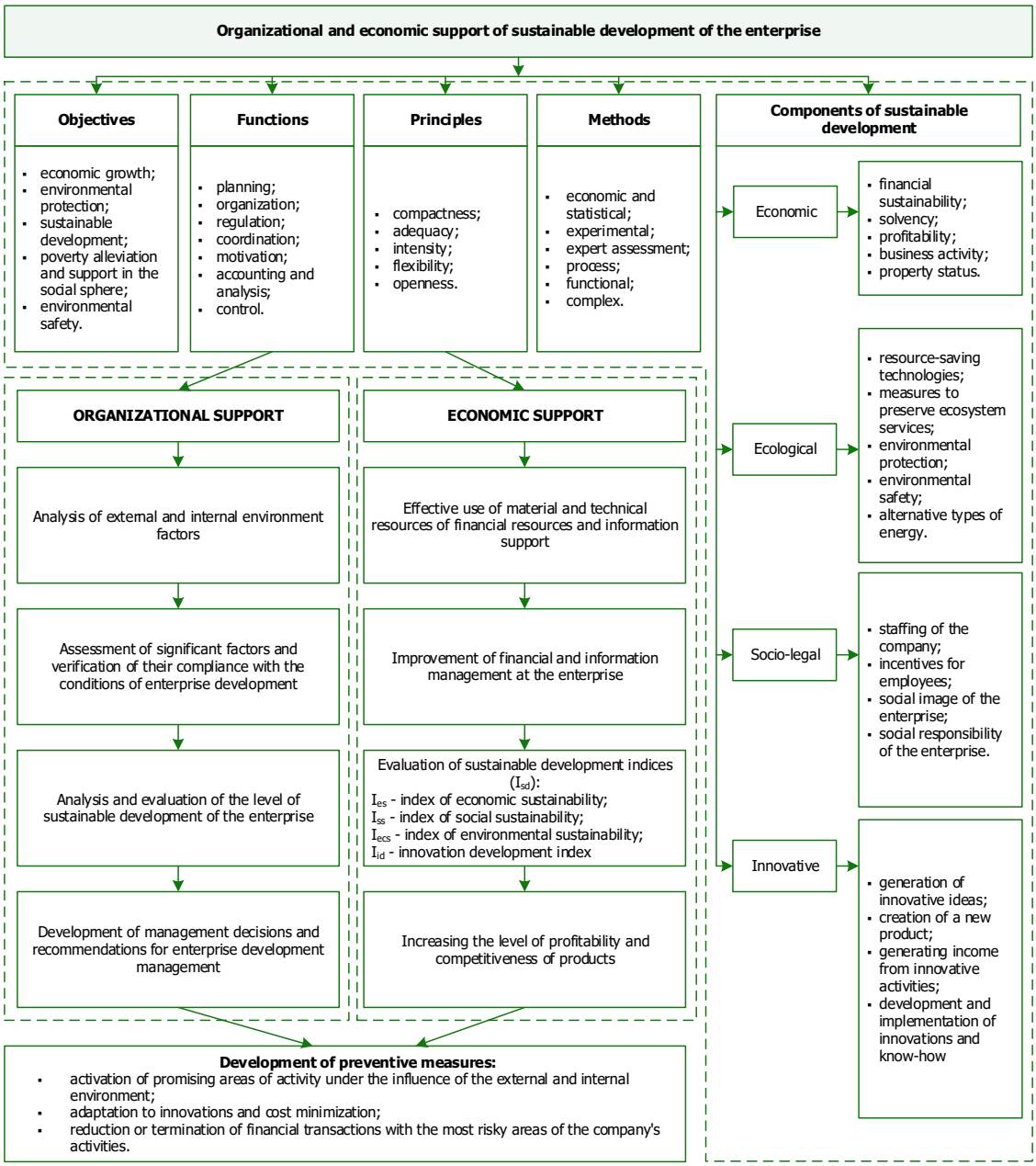

Figure 1. System of organizational and economic support for sustainable development of the enterprise.

Such a system involves the allocation of two integrated subsystems:

- organizational (planning of the company's activities, formation of relations between the company's divisions, organization of management processes, ensuring compliance with regulatory requirements, accounting and control of management decisions, formation of functional information subsystems, formation of the qualitative composition of the management staff, motivational policy);
- economic (improving financial and information management at the enterprise, increasing the level of profitability and competitiveness of products, forming the enterprise's links with the external environment and the efficiency of the enterprise in the context of sustainable development).

Based on the implementation of an effective system of organizational and economic support, which is formed at the enterprise, it is possible to achieve an increase in labour productivity, cost rationalization, increase in production efficiency, product competitiveness and improvement of financial and economic results. Positive changes in these performance indicators of enterprises indicate an increase in the efficiency of the formation of organizational and economic support for the sustainable development of enterprises.

At the current microeconomic level, an enterprise can be effective only if it voluntarily contributes investment resources in the social, economic, environmental, and innovative spheres. Thus, for the development of enterprises, not only the process of attracting investment resources is important, but also their innovative orientation, which makes it possible to achieve an increase in profits and incomes of owners, increase efficiency, increase the market value of the enterprise, increase the competitiveness and sustainability of the enterprise in the market [13; 23; 24].

Given the overall growth rate of production, a necessary prerequisite in modern realities is the development of transport enterprises development strategy that will reduce the depletion of the natural resource base, preserve biodiversity, ensure the sustainable functioning of ecosystems and favourable sanitary conditions for the population, and reduce the harmful effects on human health.

With a view to improving the efficiency of transport enterprise management and evaluating its sustainable development on the basis of a four-factor model, which includes socio-legal, economic, ecological, and innovative components and allows presenting the sustainable development of an enterprise as a set of factors and indicators that form it, the authors suggest a multifactor model for assessing the sustainable development of transport enterprise (Figure 2).

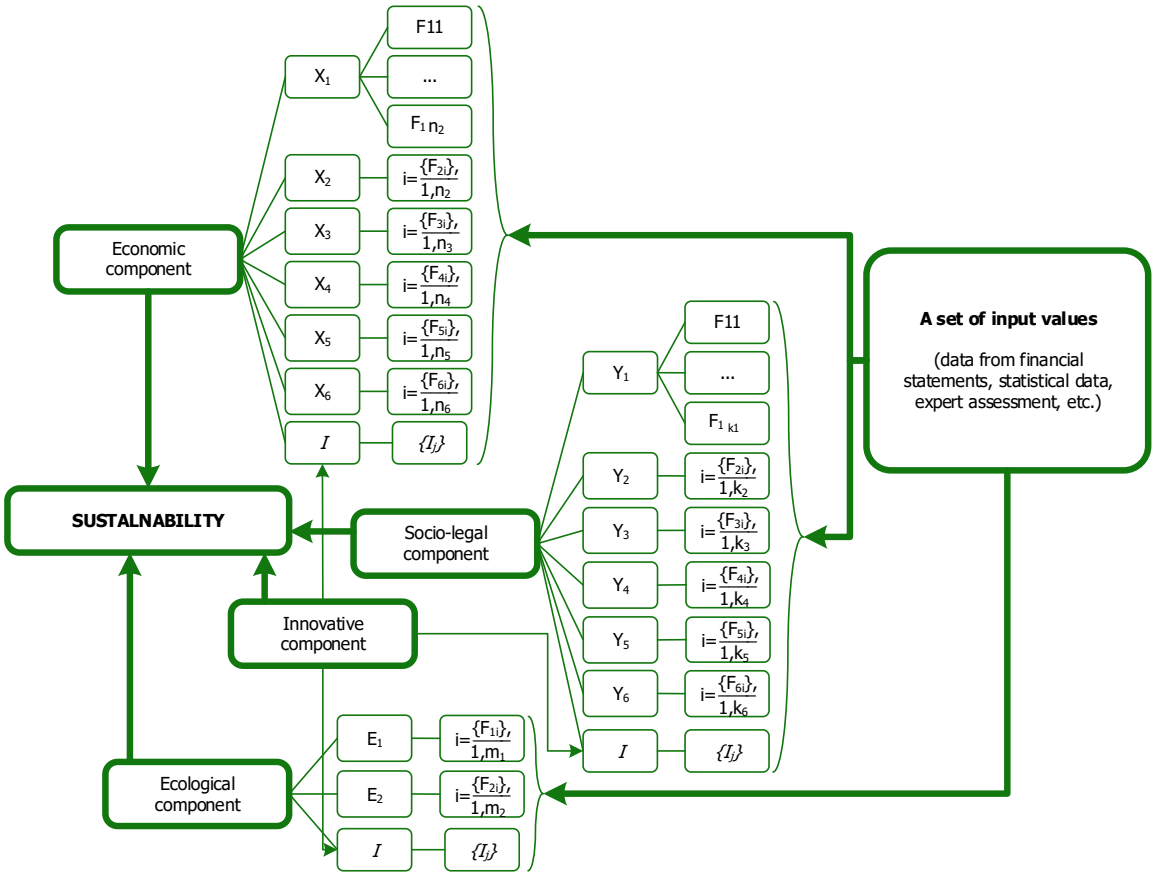

Figure 2. Multifactor model for evaluation of the sustainable development of transport enterprise.

DOI: 10.55643/fcaptp.4.51.2023.4121

The mathematical model for calculating the Sustainable Development Index (Isd) of transport enterprise, which has the form:

$$I_{sd} = \lambda_1 I_{es} + \lambda_2 I_{ss} + \lambda_3 I_{ecs} + \lambda_4 I_{id}, \quad (1)$$

where $\lambda_j,\ j \in \{1,2,3,4\}$ *– the weighting factors;* $I_{es} = F_{es}(X_1, \dots, X_6, I_{id})$ *– index economic sustainability;* $I_{ss} = F_{ss}(Y_1, \dots, Y_6, I_{id})$ *– index of socio-legal sustainability;* $I_{ecs} = F_{ecs}(S_1, S_2, I_{id})$ *– index ecological sustainability;* I_{id} *– index innovation development.*

Based on the study of transport industry enterprises, an expert assessment was carried out and it was determined that the most significant component that shapes sustainable development is economic (with a weighting coefficient of λ_1=0,38), the second place is occupied by the socio-legal (with a weighting coefficient of λ_2=0,24), and the third - by the ecological (with a weighting coefficient of λ_3=0,21). At the same time, the innovative component exerts a formative influence on both the three above-mentioned components and acts as an independent variable in the formation of the integral indicator of sustainable development (with a weighting factor of λ_4=0,17).

Based on the results of the expert assessment, we obtained the values of the weighting coefficients and substantiated the formulas for calculating the indices. The expert assessment was checked for consistency, and the corresponding values of the concordance coefficient and the level of significance with which the hypothesis of consistency of expert assessments is accepted are shown in Table 1.

Table 1. Models for calculating the sustainable development index for the transport industry.

Index	Mathematical model	Concordance ratio	Level of significance
I_{es}	$I_{es} = 0{,}2 \cdot X_1 + 0{,}2 \cdot X_2 + 0{,}2 \cdot X_3 + 0{,}1 \cdot X_4 + 0{,}1 \cdot X_5 + 0{,}1 \cdot X_6 + 0{,}1 \cdot I_{id}$	0.9103	<0.05
I_{ss}	$I_{ss} = 0{,}2 \cdot Y_1 + 0{,}1 \cdot Y_2 + 0{,}2 \cdot Y_3 + 0{,}1 \cdot Y_4 + 0{,}2 \cdot Y_5 + 0{,}1 \cdot Y_6 + 0{,}1 \cdot I_{id}$	0.8970	<0.05
I_{ecs}	$I_{ecs} = 0{,}5 \cdot S_1 + 0{,}4 \cdot S_2 + 0{,}1 \cdot I_{id}$	0.9004	<0.05
I_{sd}	$I_{sd} = 0{,}38 \cdot I_{es} + 0{,}24 \cdot I_{ss} + 0{,}21 \cdot I_{ecs} + 0{,}17 \cdot I_{id}$	0.9051	<0.05

Based on the analysis of industry-wide indicators, the average value of the sustainable development index for transport enterprises was determined, which is I_{sd}=0,56.

Taking into account the normalization of I_{sd} values, we define the scale in the interval [0,1], which are shown in Table 2.

Table 2. The scale of values of the sustainable development index.

Value range	Interpretation
$0.92 \le I_{sd} \le 1$	Absolutely sustainable level of development
$0.74 \le I_{sd} < 0.92$	High level of sustainable development
$0.38 \le I_{sd} < 0.74$	Medium level of sustainable development
$0.20 \le I_{sd} < 0.38$	Low level of sustainable development
$0.02 \le I_{sd} < 0.20$	The crisis state of sustainable development
$0 \le I_{sd} < 0.02$	Critical level of sustainable development

It should be noted that the index of sustainable development of enterprises can be used as an integral indicator of the state and activities of the enterprise, to compare different enterprises of the same industry and the indicators of an individual enterprise with the general industry indicators.

A model for assessing the Sustainable Development Index (I_{sd}) has been developed (Figure 3), which allows to analyze the indicators of economic, socio-legal, ecological and innovative components of the transport enterprise, as well as to determine the existing links between the components of sustainable development and analyze their indicators and formulate a strategy for their improvement and optimization.

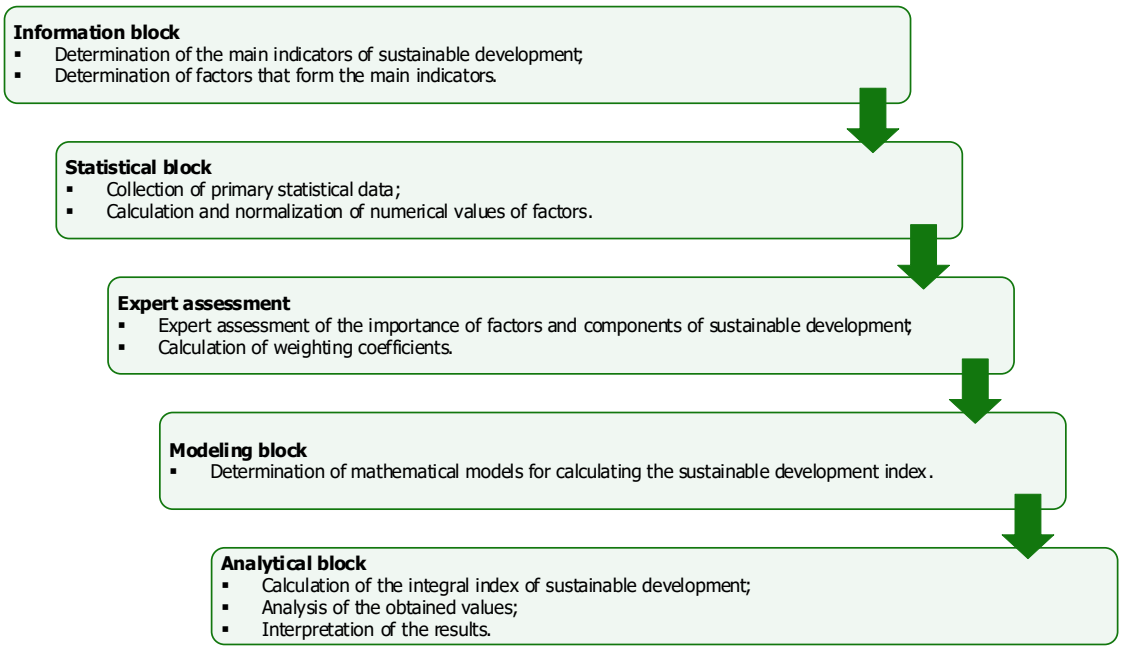

Figure 3. Algorithm for assessing the Sustainable Development Index (I_{sd}) of transport enterprises.

The suggested mathematical model was tested for five transport enterprises, for which the level of sustainable development was assessed for the period 2020-2022 (Table 3). For each enterprise, an analysis was carried out by individual components of sustainable development, on the basis of which it was predicted how the increase in the efficiency of the enterprise's innovation activity will affect the Sustainable Development Index (I_{sd}).

Table 3. Index of sustainable development of transport enterprises. *(Source: compiled by the authors based on the [25])*

Index	2020	2021	Shift 2021-2020	2022	Shift 2022-2021
PE «TRANS LOGISTICS»					
Economic sustainability	0.5853	0.5954	0.0101	0.6878	0.0924
Socio-legal sustainability	0.3727	0.3062	-0.0664	0.3481	0.0419
Ecological sustainability	0.4037	0.4542	0.0505	0.5868	0.1326
Innovative development	0.4706	0.5397	0.0691	0.5788	0.0391
Sustainable development index	0.4766	0.4869	0.0102	0.5665	0.0797
PJSC «DHL INTERNATIONAL UKRAINE»					
Economic sustainability	0.4037	0.4542	0.0505	0.5868	0.1326
Socio-legal sustainability	0.3727	0.3062	-0.0664	0.3481	0.0419
Ecological sustainability	0.3824	0.3682	-0.0142	0.4143	0.0461
Innovative development	0.4478	0.5373	0.0895	0.5970	0.0597
Sustainable development index	0.3993	0.4147	0.0155	0.4950	0.0803
LLC «MERSK UKRAINE»					
Economic sustainability	0.4670	0.3477	-0.1193	0.4271	0.0795
Socio-legal sustainability	0.3727	0.3062	-0.0664	0.3481	0.0419
Ecological sustainability	0.3930	0.3554	-0.0376	0.3666	0.0113
Innovative development	0.4002	0.4067	0.0065	0.5243	0.1176
Sustainable development index	0.4175	0.3494	-0.0681	0.4120	0.0626
LLC «HUD LOGISTICS»					
Economic sustainability	0.2719	0.3115	0.0396	0.2585	-0.0530
Socio-legal sustainability	0.3727	0.3062	-0.0664	0.3481	0.0419
Ecological sustainability	0.3580	0.3737	0.0157	0.3783	0.0046
Innovative development	0.3008	0.3811	0.0804	0.4008	0.0197
Sustainable development index	0.3191	0.3351	0.0160	0.3294	-0.0058

(continued on next page)

DOI: 10.55643/fcaptp.4.51.2023.4121

Table 3. Continued

Index	2020	2021	Shift 2021-2020	2022	Shift 2022-2021
LLC «JEFCO UKRAINE»					
Economic sustainability	0.3187	0.4626	0.1439	0.4428	0.0200
Socio-legal sustainability	0.3727	0.3062	-0.0664	0.3481	0.0419
Ecological sustainability	0.3193	0.3187	-0.0006	0.4994	0.1807
Innovative development	0.3232	0.3529	0.0297	0.4592	0.1063
Sustainable development index	0.3326	0.3762	0.0436	0.4347	0.0586

For the enterprises of PE "TRANS LOGISTICS" and PJSC "DHL INTERNATIONAL UKRAINE", the values of the Sustainable Development Index (I_{sd}) in 2020-2022 are in the area of medium development and show positive dynamics, with the highest indicators demonstrated by PE "TRANS LOGISTICS". The worst indicators of the Sustainable Development Index are at the enterprise LLC "HUD LOGISTICS" - during 2020-2022, it was in the low level of sustainable development and reduced the indicator in 2022. In 2022, the enterprises LLC "MERSK UKRAINE" and LLC "JEFCO UKRAINE" showed an increase in the Sustainable Development Index (I_{sd}) and a transition to the medium level from the low level (Figure 4).

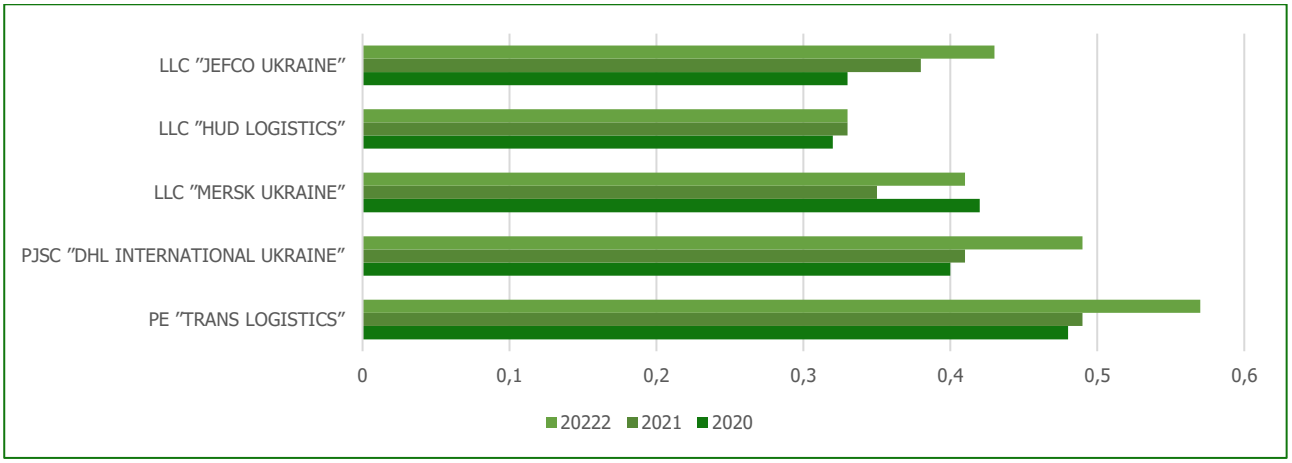

Figure 4. Dynamics of changes in the values of the Sustainable Development Index (I_{sd}) for transport enterprises. *(Source: compiled by the authors based on the [25])*

The main reasons for the low level of sustainable development indicators of these enterprises are as follows:

- medium or low level of economic sustainability at all enterprises, except for PE "TRANS LOGISTICS" and PJSC "DHL INTERNATIONAL UKRAINE";
- low indicators of social, legal and environmental sustainability for all enterprises in the sample, which corresponds to the industry average.

At the same time, all enterprises demonstrated positive dynamics of innovation performance. At the same time, the largest increases in 2022 were demonstrated by the leaders - PJSC "DHL INTERNATIONAL UKRAINE": +0.0803 and PE "TRANS LOGISTICS": +0.0797.

Let us present a forecast assessment of the change in the sustainable development indicator for PE "TRANS LOGISTICS", provided that the Innovation Development Index increases by 1%. Taking into account the obtained mathematical models of dependencies, we will determine the increase in the Sustainable Development Index (ΔI_{sd}):

$$\Delta I_{sd} = 0{,}38 \cdot \Delta I_{es} + 0{,}24 \cdot \Delta I_{ss} + 0{,}21 \cdot \Delta I_{ecs} + 0{,}17 \cdot \Delta I = 0{,}38 \cdot 0{,}1 \cdot \Delta I + 0{,}24 \cdot 0{,}1 \cdot \Delta I + 0{,}21 \cdot 0{,}1 \cdot \Delta I + 0{,}17 \cdot \Delta I = 0{,}0253. \quad (2)$$

Therefore, we can conclude that if the Innovation Development Index increases by 1%, the Integral Sustainability Index of PE "TRANS LOGISTICS" will increase by 0.0253. That is, if other factors remain unchanged, its value will be 0.5918, which will also belong to the area of medium level of sustainable development but will exceed the industry average by 0.0318.

The study has led to the following conclusions: despite the positive dynamics of the Innovation Development Index, which has a positive impact on the Integral Indicator of Sustainable Development of Enterprises, it is also necessary to consider

other systemic components, such as the index of economic sustainability, socio-legal and ecological sustainability, which must be taken into account when developing a sustainable development strategy for an enterprise.

DISCUSSION

When discussing the results of the study and its comparison, it is necessary to consider studies that are similar to ours. For example, many scientists [4-7] have studied sustainable development as a harmonious process that ensures balanced economic growth and meets the needs of society in preserving natural resource potential, economic, social and environmental factors. Discussing the results of the research, it should be noted that the achievement of sustainable development goals is facilitated by the factors of the external and internal environment and their effective use. The sustainable development of enterprises is not only a scientific and practical concept but also an absolutely necessary condition for ensuring the stable functioning of the state, the socioeconomic system and the global system as a whole. According to scholars, it is indisputable that social and environmental aspects are fully integrated into the concept of sustainable development of structures and systems at the macro- and microeconomic levels. Based on the analysis of the material, it can be argued that the economic component occupies a decisive place in the aggregate of sustainable development components, which creates conditions for the effective functioning of other subsystems. To realize sustainable development from the economic, social and environmental points of view, it is necessary to develop special mechanisms for their balanced interaction.

Such scientists [8-11] distinguish the organizational and economic support of the enterprise's functioning in the context of sustainable development as a set of organizational and economic levers (each lever has its own form of managerial influence) that affect the economic and organizational parameters of the enterprise management system. We believe that such an interpretation allows us to fully understand the essence of organizational and economic support of management, which is aimed at achieving a rational and efficient flow of a number of processes at the enterprise and the formation of profitable activities. At the same time, it becomes clear that within the framework of organizational and economic support, it is necessary to manage a fairly wide range of various processes. This requires a meaningful study of both the organizational and economic support itself and its elements, ways to effectively manage them and search for the necessary improvements. Speaking of similar results, it should be noted that the difference presented in ours is obvious. The article presents a new conceptual model for the formation and assessment of organizational and economic support for the sustainable development of transport enterprises, which is distinguished by its scientific and practical orientation.

CONCLUSIONS

Organizational and economic support for sustainable development of enterprises is a complex and multifaceted concept, the essence of which must be understood and disclosed taking into account organizational (influence factors) and economic (resource potential and performance indicators) factors. The effectiveness of the formation of organizational and economic management of sustainable development of transport enterprises depends on the level of innovation and environmental protection. The introduction of new innovative approaches, technologies and processes can contribute to reducing the negative impact on ecosystem services and efficient use of resources. For example, the introduction of green technologies, environmentally friendly materials or energy-efficient processes will help reduce greenhouse gas emissions and the environmental burden of the enterprise. There is a two-way relationship between innovation and sustainable development. On the one hand, economic, social and environmental factors improve as a result of intensified innovation. On the other hand, these changes lead to the accumulation of funds, knowledge and skills to spread innovation processes in the country. According to global experience, the socio-economic development of developed countries is at a stage where the benefits of sustainable development are realized through effective education systems with developed innovation structures and regulatory support for innovation. At the same time, the environmental orientation of enterprises is characterized by a management system focused on establishing the principles of environmental and economic activity. This affects environmental strategies and plans, which, in turn, influence production structures and employee behaviour. An environmental strategy is a long-term way to improve the environmental performance of production processes and products without compromising the economic success of the enterprise.

In order to improve the efficiency of transport enterprise management, a conceptual model for assessing the sustainable development of enterprises in the form of indices of economic, ecological, innovative, and socio-legal sustainability has been formed. This model makes it possible to interpret the indicators of financial activity of enterprises in the form of weighting coefficients. This ensures that the system of financial indicators is taken into account in the developed factors and, accordingly, in the suggested model indicators.

DOI: 10.55643/fcaptp.4.51.2023.4121

ADDITIONAL INFORMATION

AUTHOR CONTRIBUTIONS

Conceptualization: *Svitlana Smerichevska, Zarina Poberezhna, Oleksii Mykhalchenko, Yuliia Shtyk, Yurii Pokanevych*
Data curation: *Svitlana Smerichevska, Zarina Poberezhna, Oleksii Mykhalchenko, Yuliia Shtyk, Yurii Pokanevych*
Methodology: *Svitlana Smerichevska, Zarina Poberezhna, Oleksii Mykhalchenko, Yuliia Shtyk, Yurii Pokanevych*
Resources: *Svitlana Smerichevska, Zarina Poberezhna*
Supervision: *Svitlana Smerichevska, Zarina Poberezhna*
Validation: *Svitlana Smerichevska, Zarina Poberezhna, Oleksii Mykhalchenko, Yuliia Shtyk, Yurii Pokanevych*
Investigation: *Svitlana Smerichevska, Zarina Poberezhna, Oleksii Mykhalchenko, Yuliia Shtyk, Yurii Pokanevych*
Project administration: *Svitlana Smerichevska, Zarina Poberezhna*
Writing – review & editing: *Svitlana Smerichevska, Zarina Poberezhna, Oleksii Mykhalchenko, Yuliia Shtyk, Yurii Pokanevych*
Writing – original draft: *Svitlana Smerichevska, Zarina Poberezhna, Oleksii Mykhalchenko, Yuliia Shtyk, Yurii Pokanevych*

REFERENCES

1. Hernandez-Vivanco, A., Bernardo, M., & Cruz-Cazares, C. (2018). *Sustainable innovation through management systems integration, 196*, 1176–1187. https://doi.org/10.1016/j.jclepro.2018.06.052
2. Figge, F., Hahn, T., Schaltegger, S., & Wagner, M. (2002a). The sustainability balanced scorecard: Linking sustainability management to business strategy. *Business, Strategy, and the Environment, 11*(5), 269–284. https://doi.org/10.1002/bse.339
3. Wagenhals, S., Garner, W., Duckers, L., & Kuhn, K. (2014). Sustainability index with integrated indicator dependencies. *Business, Management and Economics Engineering, 12*(1), 15-29. https://doi.org/10.3846/bme.2014.02
4. Vasyutkina, N. V. (2017). Sustainable development as the basis of the growth of the national economy: problems, solutions. *Ekonomichnyy visnyk universytetu, 34*(1), 150-163. https://cyberleninka.ru/article/n/staliy-rozvitok-yak-osnova-zrostannya-natsionalnoyi-ekonomiki-problemi-shlyahi-virishennya/viewer
5. Vetsko, T. M. (2019). Sustainable enterprise development: problems and prospects. Aktualni problemy ekonomiky ta upravlinnya: zbirnyk naukovykh prats molodykh vchenykh, 13. https://ela.kpi.ua/bitstream/123456789/29380/1/2019-13_2-04.pdf
6. Burda, A. I. (2011, May 18-20). Peculiarities of managing the sustainable development of the enterprise. Mizhnarodna stratehiya ekonomichnoho rozvytku rehionu: materialy dopovidey II mizhnar. nauk.- prakt. konf. Sumy: SumDU, 29-30.
7. Angela Kuznyetsova, Iryna Boiarko, Myroslava Khutorna, and Yuliia Zhezherun (2022). Development of financial inclusion from the standpoint of ensuring financial stability. *Public and Municipal Finance, 11*(1), 20-36. https://doi.org/10.21511/pmf.11(1).2022.03
8. Dovgan, L.E., & Dudukalo, G.O. (2012). Formation of the organizational and economic mechanism of effective enterprise management. Ekonomichnyy visnyk NTUU «KPI», 48–56. http://economy.kpi.ua/uk/node/376
9. Shashina, M.V., & Nedzelskyi, A.O. (2023). Interrelationship of the organizational and economic mechanism of ensuring profitability and sustainable development. *Rynkova ekonomika: suchasna teoriya i praktyka upravlinnya, 21, 3*(52), 298-309. https://doi.org/10.18524/2413-9998.2022.3(52).275812
10. Marshuk, L.M. (2017). Development of an organizational and economic mechanism for the formation and use of the enterprise's resource and financial potential. Intellect XXI, 6, 66-69.
11. Makhinko, V. Ya. (2022). Formation of an organizational and economic mechanism for managing the development of an industrial enterprise. Naukovyy visnyk Poltavskoho universytetu ekonomiky i torhivli. *Seriya «Ekonomichni nauky», 2*(106), 14-18. https://doi.org/10.37734/2409-6873-2022-2-2
12. Kryvovyazyuk, I., Britchenko, I., Smerichevskyi, S., Kovalska, L., Dorosh, V., Kravchuk, P. (2023). Digital Transformation and Innovation in Business: the Impact of Strategic Alliances and Their Success Factors. Economic Studies *Journal (Ikonomicheski Izsledvania), 32*(1), 3-17. URL: https://www.calameo.com/read/005426639724d74058c8e

13. Lepeyko T., Chernoivanova H., Pererva I., Poberezhna Z., Zabashtanska T. (2021). The Role of the Mechanism of Attracting Investment Resources in the Innovative Development of Enterprises in the Context of the Digital Economy Development. IJCSNS *International Journal of Computer Science and Network Security, 21*(11), 223–229. https://doi.org/10.22937/IJCSNS.2021.21.11.31

14. Mio, C., Panfilo, S., & Blundo, B. (2020). Sustainable Development Goals and the Strategic Role of Business: A Systematic Literature Review. *Bus. Strategy Environ, 29*, 3220–3245. https://doi.org/10.1002/bse.2568

15. Alvarez Jaramillo, J., Zartha Sossa, J. W., and Orozco Mendoza, G. L. (2019). Barriers to sustainability for small and medium enterprises in the framework of sustainable development. *Business Strategy and the Environment, 28*(4), 512– 524. http://doi.org/10.1002/bse.2261

16. Kuznyetsova, A., Klipkova, O., & Maslov, V. (2022). Methodology of evaluation of performance of public-private partnership projectS. *Financial and Credit Activity Problems of Theory and Practice, 6*(41), 339–349. https://doi.org/10.18371/fcaptp.v6i41.251466

17. Calabrese, A., Forte, G., and Ghiron, N. L. (2018). Fostering sustainability-oriented service innovation (SOSI) through business model renewal: The SOSI tool. *Journal of Cleaner Production, 201*, 783–791. http://doi.org/10.1016/j.jclepro.2018.08.102

18. Fleming, A., Wise, R. M., Hansen, H., and Sams, L. (2017). The sustainable development goals: A case study. *Marine Policy, 86*, 94–103. http://doi.org/10.1016/j.marpol.2017.09.019

19. Hahn, R., & Kuhnen, M. (2013). Determinants of sustainability reporting: A review of results, trends, theory, and opportunities in an expanding field of research. *Journal of Cleaner Production, 59*, 5– 21. https://doi.org/10.1016/j.jclepro.2013.07.005

20. Hak, T., Janouskova, S., & Moldan, B. (2016). Sustainable development goals: A need for relevant indicators. *Ecological Indicators, 60*, 565– 573. https://doi.org/10.1016/j.ecolind.2015.08.003

21. Monteiro, N. R., Silva, E. A., and Moita Neto, J. M. (2019). Sustainable development goals in mining. *Journal of Cleaner Production, 228*, 509–520. http://doi.org/10.1016/j.jclepro.2019.04.332

22. Noci G., Verganti R. (1999). Managing "green" product innovation in small firms. *R&D Management, 29*(1), 3– 15. https://doi.org/10.1111/1467-9310.00112

23. Wu, J., Guo, S., Huang, H., Liu, W., and Xiang, Y. (2018). Information and communications technologies for sustainable development goals: State-of-the-art, needs and perspectives. *IEEE Communications Surveys & Tutorials, 20*(3), 2389–2406. https://www.semanticscholar.org/paper/Information-and-Communications-Technologies-for-and-Wu-Guo/ba4cb3c14205aa08ffbec020c56a11e46990f2bd

24. Gunawan, J., Permatasari, P., and Tilt, C. (2020). Sustainable development goal disclosures: Do they support responsible consumption and production? *Journal of Cleaner Production, 246*, 2–12. http://doi.org/10.1016/j.jclepro.2019.118989

25. Official website of the State Statistics of Ukraine. http://www.ukrstat.gov.ua/

Смерічевська С., Побережна З., Михальченко О., Штик Ю., Штик Ю.

МОДЕЛЮВАННЯ Й ОЦІНКА ОРГАНІЗАЦІЙНО-ЕКОНОМІЧНОГО ЗАБЕЗПЕЧЕННЯ СТАЛОГО РОЗВИТКУ ТРАНСПОРТНИХ ПІДПРИЄМСТВ: ІННОВАЦІЙНИЙ ТА ЕКОЛОГІЧНИЙ АСПЕКТИ

Основною метою дослідження є формування концептуальної моделі організаційно-економічного забезпечення та проведення оцінки сталого розвитку транспортних підприємств. Науково обґрунтовано та доведено, що формування сталого розвитку підприємства залежить від виявлення й систематизації факторів. які на нього впливають, розробки динамічної моделі та її оцінки. Запропоновано систему організаційно-економічного забезпечення сталого розвитку підприємства, яка представлена з урахуванням основних складових, таких як: економічна, соціально-правова, екологічна та інноваційна, що сприяє ефективності функціонування підприємства, підвищення його прибутковості, цим самим забезпечуючи динамічну рівновагу на ринку. У дослідженні використано методи аналізу, експертних оцінок, методи дедукції й індукції, методи систематизації та абстрактні методи. Актуалізовані напрями й практичні рекомендації управління сталим розвитком транспортного підприємства. Запропонована модель оцінки сталого розвитку транспортного підприємства, що дозволяє оптимізувати його діяльність, визначити наявні можливості для розвитку, а також шляхи для підвищення рівня розвитку в майбутньому, що, на відміну від інших, дозволяє комплексно й усебічно оцінити поточний рівень сталого розвитку. Модель оцінки сталого розвитку транспортного підприємства полягає у визначенні та оцінці індексів сталого розвитку. Установлено, що найбільш суттєвою складовою, що формує сталий розвиток, є економічна (із ваговим коефіцієнтом 0,38), друге місце займає соціально-

DOI: 10.55643/fcaptp.4.51.2023.4121

правова (із ваговим коефіцієнтом 0,24), третє – екологічна (із ваговим коефіцієнтом 0,21). При цьому інноваційна складова й здійснює формоутворюючий вплив на три вищезазначені складові, і виступає незалежною змінною при формуванні інтегрального показника сталого розвитку (із ваговим коефіцієнтом 0,17). Використання запропонованої моделі визначення рівня сталого розвитку транспортних підприємств дозволяє зосередити увагу керівників підприємства на розробці заходів щодо підвищення ефективності функціонування та мінімізації впливу зовнішнього середовища при веденні господарської діяльності.

Ключові слова: моделювання, оцінка, організаційно-економічне забезпечення, транспортні підприємства, сталий розвиток, складові сталого розвитку, інноваційний розвиток, вплив на довкілля.

JEL Класифікація: : L91, Q56, C52, O4, O3