JUSTIFICATION OF THE EFFICIENCY OF THE SUBSYSTEMS OF THE SEA TRANSPORT INDUSTRY IN CONDITIONS OF ASYMMETRY

Abstract. The principles of sustainable development of the global economy predetermine the patterns and limitations of economic growth of individual industries. The systemic influence of maritime transport on the normalization of the international division of labor requires the adoption of effective investment and economic decisions that stimulate the competitive positioning of the fleet and ports. As systemic restrictions on the development of production subsystems of the maritime transport industry, the requirements of international maritime organizations should be considered based on the standards of general safety of navigation and environmental friendliness of cargo delivery technologies. The role of a new segment of competitive advantages in the form of alternative transport routes is increasing. One of the limitations for the development of this strategy is the requirement for strict coordination of the interaction between participants in operator and investment activities.

The evolving landscape of maritime transport demands a nuanced approach, emphasizing adaptability and resilience. Embracing advancements in technology, alongside a commitment to sustainability, becomes pivotal in steering the industry towards a harmonious coexistence with the environment. As the maritime transport industry continues to evolve, the balance between economic viability, environmental responsibility, and adherence to international standards emerges as a critical focal point for sustainable growth. At the same time, the introduction of advanced technologies and commitments to environmental sustainability is becoming a strategic managed diversification in the field of global maritime trade. As the industry evolves, the emergence of new opportunities requires a balanced approach where economic efficiency is combined with environmental protection and compliance with international standards.
In conclusion, this abstract provides a glimpse into the intricate interplay between the principles of sustainable development, systemic constraints within the maritime transport industry, and the rising significance of alternative transport routes. Navigating these dynamics requires a holistic approach, incorporating innovative technologies, strategic investments, and collaborative efforts to ensure a resilient and sustainable future for global maritime trade.

**Keywords:** merchant shipping, sustainability, efficiency, asymmetry, transport routes.

Стахов Арсеній Юрійович аспірант кафедри «Публічне управління та адміністрування», Національний університет «Одеська політехніка», проспект Шевченка, 1, м. Одеса, 65044, https://orcid.org/0000-0001-9739-649

**ОБІГРУНТУВАННЯ ЕФЕКТИВНОСТІ СТАНУ ПІДСИСТЕМ МОРСЬКОЇ ТРАНСПОРТНОЇ ІНДУСТРІЇ В УМОВАХ АСИМЕТРИЧНОСТІ**

**Анотація.** Принципи сталого розвитку глобальної економіки зумовлюють закономірності та обмеження економічного зростання окремих галузей. Системний вплив морського транспорту на нормалізацію міжнародного поділу праці вимагає прийняття ефективних інвестиційних та економічних рішень, які стимулюють конкурентне позиціонування флоту та портів. В якості системних обмежень розвитку виробничих підсистем галузі морського транспорту слід розглядати вимоги міжнародних морських організацій, що базуються на стандартах загальної безпеки судноплавства та екологічності технологій доставки вантажів. Зростає роль нового сегменту конкурентних переваг у вигляді альтернативних транспортних шляхів. Одним із обмежень для розробки цієї стратегії є вимога чіткої координації взаємодії учасників операторської та інвестиційної діяльності.

Ландшафт морського транспорту, що розвивається, вимагає тонкого підходу, наголошуючи на адаптивності та стійкості. Врахування прогресу в технологіях разом із зобов’язаннями щодо сталого розвитку стає ключовим у спрямованні галузі до гармонійного співіснування з навколишнім середовищем. Оскільки індустрія морського транспорту продовжує розвиватись, баланс між економічною життєздатністю, відповідальністю за навколишнє середовище та дотриманням міжнародних стандартів стає критично важливою точкою сталого зростання. При цьому запровадження передових технологій та зобов’язань щодо екологічності стає стратегічним керованим у розширення уфіції в сфері глобальної морської торгівлі. У міру того, як галузь розвивається, поява нових можливостей вимагає збалансованого підходу, де ефективність економіки поєднується зі збереженням довкілля та дотриманням міжнародних стандартів.
Ця анотація дає змогу зазирнути у складну взаємодію між принципами сталого розвитку, системними обмеженнями в галузі морського транспорту та зростаючою значимістю альтернативних транспортних маршрутів. Керування цією динамікою вимагає цілісного підходу, що включає інноваційні технології, стратегічні інвестиції та спільні зусилля для забезпечення стійкого та сталого майбутнього глобальної морської торгівлі.

Ключові слова: торгівельне судноплавство, стійкість, ефективність, асиметрія, транспортні коридори.

**Formulation of the problem.** The uneven dynamism of the global economy determines the pattern of reactions in terms of asymmetry indicators. The functioning of the production subsystems of the maritime transport industry in the global maritime trade market within these constraints is based on the use of a variety of competitive strategies. They are based both on the differentiation of innovative approaches and on areas for improving the organization and management of fleet or port positioning in priority segments of the maritime transport industry.

Therefore, it is important to consider the characteristics of the reaction of ship-owning structures to external changes in essence and assessments outside of transport results. The characteristics of the competitiveness of operator activities in the conditions of permanent improvement of economic relations strictly depend on the availability of innovative projects. At any scale of economic relations, problems of priority positioning of enterprises arise. The main thing in this aspect is the choice of the form and directions for achieving advantages in terms of innovative, organizational and managerial resources. Therefore, there are many approaches to a comprehensive assessment of competitive strategies.

Sustainability of development and competitiveness are considered in the form of the potential and real ability of firms in the current conditions to produce goods and services that, based on their totality of characteristics, are more attractive to consumers than the goods of other suppliers. This is precisely what allows us to focus on the implementation of “disruptive” technologies of various corporations in the system of standard and new transport corridors.

**Analysis of the current state of the problem.** Modern research focuses on both the contradictions of sustainable development and competitive strategies. In the realm of the sea transport industry, the current landscape is marked by a complex interplay of challenges, notably the pervasive condition of asymmetry. Asymmetric conditions arise from disparities in information, resources, and operational capacities among stakeholders, posing significant hurdles to the seamless functioning of subsystems within the industry. Many domestic and international experts were engaged in justifying possible problems in this area, as well as searching for their solutions.

**Objectives and goals of the article:** The main goal of the article is to consider the economic approaches of operators and cargo-owning structures to achieve
competitive advantages in long-term retention of the position of corporate transport subsystems. In addition, attention is focused on the development of a method for assessing economic decisions in the system of asymmetry of parameters of the global maritime trade market.

**Main material.** Development strategies for maritime transport units in the global economy are strictly determined by the nature of the changing position of individual economic unions and states in the international division of labor. In the theory of sustainable development, strategies for the rational use of natural potential and innovative advances in meeting current needs acquire fundamental importance. Strengthening the role of transport and economic relations in the structure of international economic relations predetermines the tasks of participation of national production subsystems in integration programs.

At the same time, the current asymmetry of East-West foreign economic relations poses fundamentally new tasks for differentiating cargo delivery routes. A conflict of interests arises between the so-called traditional maritime powers and states that are intensively increasing the carrying capacity of the national merchant fleet [1]. Simultaneously with the growth of cargo flows, problems arise in choosing cargo delivery routes with a revaluation of the role of time and delivery price criteria.

But in the conditions of turbulence in the energy resources market, the directions for choosing systemic security for investment and economic needs become problematic. This concerns the relationship between the use and delivery technology of oil, gas, shale technologies and coal. At the same time, the structure of production by region of the world, which determines the relationship between the technological and energy parts of individual types of energy resources, is not clearly predicted. That is, for the production of steel and chemical products and for the production of electricity.

The particular importance of merchant shipping in ensuring economic security makes structural restructuring advisable even on the basis of a budget deficit. In this case, public investment ensures the creation of new jobs and the formation of an additional flow of foreign currency.

A comparison of the rates of change in production volume, foreign trade and maritime transport reflects the increasing role of transport and economic relations. That is why the alternativeness and diversity of routes and transport corridors for the delivery of goods is being considered.

The law of diminishing returns in the maritime transport industry manifests itself with the expansion of the scale of investment due to the implementation, first of all, of highly effective development options. At the next stages of growth, solutions with lower profitability in terms of both technical and natural factors of location of production potential are involved in the design [2].

Due to the implementation of the principles of sustainable economic development according to systemic security criteria, individual maritime powers are adjusting their state maritime policy. For example, Great Britain has formed a set of
measures to maximize the potential of a maritime power strategy. In accordance with
the approach of the Maritime UK group, the largest association of the British
maritime industry, which generates annual profits of $17 billion and unites 113
thousand people, a concept has been developed for maximizing the deadweight of
the fleet under the national flag. It is taken into account that in recent years, due to
economic conditions, many shipping companies have left the flag of the country. In
the structure of development strategies of the national maritime transport industry,
along with the intensification of investment activities, the attitude towards flags of
convenience stands out. It is important, together with government structures and the
business segment, to choose the optimal conditions for registering a fleet under the
national flag.

In this regard, the problems of investment support for the development of the
maritime transport complex of Ukraine are aggravated. Among the competitive risks
for the positioning of Ukrainian ports in transit cargo flows, strategies for advanced
development of the ports of Romania and the Baltics occupy a special place. This is
evidenced by the desire of the port of Klaipeda to become a hub. The port carries
out targeted deepening of the water area and the approach channel to 17 m. Container
terminals are being developed by global operators - MSC, Maersk. Hamburg
becomes a container hub, capable of receiving ships with a capacity of up to 18
thousand TEU. This is precisely what limits the use of the Ukrainian part of the
potential of the Trans-Caspian East-West route.

Among the strategies for sustainable transport services to the world economy,
transport corridors and routes that ensure the mutual interest of the main operators
stand out. In particular, the so-called “New Silk Road”, which provides for an
alternative service for East-West freight traffic along the Trans-Caucasian route.
Ukraine, Georgia, Azerbaijan and Kazakhstan, on the basis of a tariff agreement, are
organizing a railway route between China and Europe based on the international
transport corridor and the Viking container train. When approaching the
implementation of this idea, the principle was violated: first, calculations of results
and costs, then the selection and implementation of a development option.

In regional transport subsystems, the interaction of all participants servicing
cargo flows, regardless of their affiliation, is important. What becomes fundamental
is not the market position, but adequate service to cargo owners, regardless of the
vessel’s flag. Under these conditions, a certain balance in the potential of the fleet’s
carrying capacity is formed. This is especially true for the Black Sea circular ferry
route for the delivery of goods to Transcaucasia, Turkey and back.

Thus, the organization of interaction between regional subsystems of maritime
transport while strengthening integration processes becomes a priority. The
fundamental problem is the formation of asymmetry in the results of the balanced
functioning of the global maritime transport industry [1]. Firstly, with an absolute
increase in transport costs in the international division of labor, the gap between the
average tariff rate and the cost of the transportation process is reduced. Secondly,
with the increasing role of innovative projects in the systemic safety of merchant shipping, a significant segment of the substandard fleet remains. Thirdly, a competitive confrontation is emerging between shipping complexes that occupy large-scale positions and the exit strategies of the national fleet of states that previously lost their positions in the maritime trade market system.

The basis for the sustainable development of any economic subsystem is the preservation and expansion of capital assets in the billing period, providing normalized average annual returns. It is the accumulation of potential, as a consequence of successful previous work, that reflects the stability of an object or complex. The level of sustainability and efficiency of the functional activities of enterprises and socio-economic systems is differentiated by stages of the life cycle [4].

The economic and legal conditions for sustainable socio-economic development are outlined. In a decision-making system in conditions of incomplete information support for maritime trade market operators, forecasts are of particular value. However, they do not provide an unambiguous assessment of the direction of development. The expected state requires active action, taking into account the risk of multidirectional possible development. With any inaccuracy, forecasts in the maritime transport industry become the starting point for technical and economic improvement of the basic state of production potential.

The basis for sustainable development and balancing of inflation processes is not the rise in prices, but the formation of an accessible consumer segment of the economy, including production and service subsystems [7]. As part of the latter, the decisive role is played by transport, focused on the mobility of the population and stimulating this process. The principle of sustainable development, if we take into account the basic priorities and the role of fixed capital, can be represented by the condition:

$$K_p + aK_l + bK_n > 0$$

where a and b – coefficient of measurability of fixed, human and natural capital (resources);

$K_p$ - the cost of fixed capital, reflecting the competitiveness of development of shipping companies;

$K_l$ – the amount of human capital required to implement the chosen development strategy;

$K_n$ - parameters of natural capital that ensure the effective functioning of the transport subsystem under consideration.

Each country, due to its implemented maritime transport policy, makes appropriate decisions. For example, due to the state of the merchant fleet, the Chinese government has recently allocated more than $290 million for the renewal of the merchant fleet in the form of subsidies to companies whose ships turned out to be worn out. This is how the strategy for decommissioning old ships is being
implemented. At the same time, this stimulates the development of the national shipbuilding industry with the expansion of the employment market. New generations of ships use resource-saving technologies, which will have a positive impact on environmental factors.

The shipping company COSCO alone received $250 million from the state as compensation for sending old ships for scrapping.

But small maritime states also choose their own approaches to sustainable positioning. Malaysia is a traditionally maritime state, historically this is due to its location near trade routes. Commitment to compliance with the rules of navigation is one of the factors in the popularity of the Malaysian register of merchant ships. The growth of an open ship register shows certain advantages. Therefore, the tonnage of registered ships in 2021 amounted to 16.8 million dwt, which is 19 times larger than the fleet of the Ukrainian registry [3].

The same applies to the Maltese shipping business. This is carried out by the Maritime Center with the support of management and tax departments. They assist in attracting ship owners and financing companies to Malta for the purpose of fleet registration and maintenance. Vessels are registered provided that they are owned by Maltese citizens or Maltese legal entities.

Despite the temporary problems of Ukraine’s maritime status, its transport potential remains the most important for the formation of real projects for the regional maritime transport industry. The logic of developing the transit potential of the country’s seaports on the basis of ferry services and cruise technologies predetermines the possibility of creating a hub for further transit communications. It is important to determine the location of stevedoring complexes, which does not create problems for passenger traffic during the period of mass holidays.

In the performance management system for the development of the maritime transport industry, greater use should be made of focusing on the most important components of modern competitive positioning - ISIS. It is based on the logic of the principle of priority advance of supply based on continuous development. For this purpose, the primary choice is the selection of indicators (I), which allow, based on the analysis of performance data, to study the trend and select the directions and principles of diversification of functional and investment activities. The strategy is then justified using innovative systems.

Conclusions. Despite the cyclical development of the world economy, the role of its transport services is increasing. In this case, attention should be concentrated on the existing system (S) of production or relations within the organization. The system should be considered as a critical structure based on the formation and selection of priority decisions. The lever of the system is highlighted, which is predetermined by the essence and features of positioning in real external conditions. Therefore, it is important to control the elements of the system that require constant or regular improvement.
Innovation (I) should be based on planning changes in capital assets and organizational forms of servicing cargo flows according to competitiveness criteria. This predetermines the directions of action and the selection of appropriate resources.

Strategy (S) for any tasks of sustainable development of regional transport complexes should include the goal of competitive positioning of the production potential of the fleet and ports in accordance with standards and other forms of restrictions.

In the structure of socio-economic restrictions on the effective development of entrepreneurial activity, the subsystems of the maritime transport industry are traditionally distinguished:
- fair participation of all alternative shipping companies and trading ports in the maritime trade market;
- formation and maintenance of the economic viability of maritime transport enterprises;
- achieving normalized social parameters of the workforce;
- providing opportunities to realize natural potential to all participants in the process;
- achieving the integrity and stability of the ecological system as the external environment of operator activity;
- ensuring conditions for a healthy environment.

The sustainability of the economic subsystem is based on the mechanisms and tools for creating a normative environment for development and functional activity. Unfortunately, in contrast to the global trend in the development of transport potential, Ukraine not only failed to ensure the competitive state of the subsystem [7], but also actually allowed the collapse of the national transport complex. Therefore, the most important aspect of the development strategy is the choice of integration directions that ensure the full use of the transit component in East-West and North-South freight flows. This is what will allow not only to predetermine transport independence, but also to optimize the transport component of the current payments account.

References:


Література:


