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**Golubkova I.**

D.Sc. in Economics, Professor, National University «Odesa maritime academy», Odesa, Ukraine;  
e-mail: [prof.irinagolubkova@gmail.com](mailto:prof.irinagolubkova@gmail.com)  
ORCID: [0000-0002-9931-8291](https://orcid.org/0000-0002-9931-8291)  
(Corresponding Author)

**Frasyniuk T.**

PhD in Economics, Associate professor National University «Odesa maritime academy», Odesa, Ukraine;  
ORCID: [0000-0003-3458-3796](https://orcid.org/0000-0003-3458-3796)

**Babachenko M.**

PhD in Economics, Associate professor National University «Odesa maritime academy», Odesa, Ukraine;  
ORCID: [0000-0002-4849-3946](https://orcid.org/0000-0002-4849-3946)

**Yavorska A.**

PhD in Economics, National University «Odesa maritime academy», Odesa, Ukraine;  
ORCID: [0000-0002-4515-4471](https://orcid.org/0000-0002-4515-4471)

**Levinska T.**

Senior lecturer, National University «Odesa maritime academy», Odesa, Ukraine;  
ORCID: [0000-0001-7257-5186](https://orcid.org/0000-0001-7257-5186)

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## FEATURES OF FORMATION OF BASIC PARAMETERS OF THE SPECIALIZED MARINE TRANSPORT FLEET

### ABSTRACT

The article discusses the basic principles of optimizing the status of subsystems of the marine transport industry. Since the positioning of stability management in any segment of transport activities reflects a system of principles, a system of the interdependence of structural elements of merchant shipping was identified. Taking into account the most important provisions for managing the economic stability of shipping and the principles of repayable financing, urgent problems of improving the assessment of business decisions by criteria and indicators reflecting the functioning of shipping companies and trading ports are considered in the article. The structure of the problems and advantages of the formation of an active marine transport strategy is presented. Some factors of the development of specialized segments of the global maritime trade market are disclosed. The regularity and conditions for the formation of the parameters of the marine transport cluster are formulated. The article discusses measures to balance the economic interests of maritime transport and the consumers of its products. On this basis, the economic stimulation of optimal economic results is intensified. The necessity of using a wider range of economic regulation in comparison with the concentration of efforts on one model in optimizing the basic state of the regional complex of maritime transport is considered. The article also takes into account the analysis of factors that contribute to the optimization of the final indicators with the parameters of the maritime trade market. Features of innovative approaches that are of fundamental importance in the transport business and reflect the intellectual property of the company's management or its consultants are highlighted. It is on the life cycle ideas of the fleet that functional and financial stability of positioning can be achieved, despite the fact that new competitors appear at regular intervals. It is recommended to systematize the conditions for achieving the parameters of transport independence in the development of international transport integration, special attention is paid to the choice of mission based on the formation of a merchant shipping system that provides standardized efficiency. This, in turn, should be achieved through the benefits of innovative freight technologies.

**Keywords:** specialization, parameters, capital cost, efficiency, merchant fleet

**JEL Classification:** F29, P45, R49

### INTRODUCTION

The pattern of concentration of resources along sea routes is clearly manifested in merchant shipping due to the specificity of the cargo transportation region. The choice of the unit of carrying capacity of the vessel for profitability becomes the main thing. The principle of ensuring sustainability according to the criteria for matching the expansion of participants in the corresponding segment of the maritime trade market is highlighted simultaneously in the strategy. At the same time, the activities of individual shipping companies with a limited investment are complicated due to the fact that with the development of the global maritime trade market, the minimum size of the capital cost of vessels that are necessary for operator activity under normal conditions increases.

Achieving adequate efficiency of the main participants in the process stands out among the principles of development of the transport industry and its branch of intermodal

communications. It should be borne in mind that the global maritime trade market includes separate segments of the specialization of merchant shipping as a whole. This principle is based on the usage of single sea space and on positioning according to the criteria of adequacy in the area of operator activity. The principle of system integrity in terms of reliability, cost-effectiveness, environmental friendliness and safety with respect to all components of the maritime trade market becomes the main one.

## LITERATURE REVIEW

In creating a specialized segment of the national maritime transport industry, technologies should be developed that take into account both the main features of cargo flows and the trend towards the use of universal technologies [1-4]. The regulation of technical policy should be based on pricing that ensures commercial objectives and stimulates the orientation of ship owning structures towards achieving the advantages of technical the economic condition of the fleet with marginal profitability. The works of such researchers as: Dykstra; Langenfeld; Miyusov/Primachev; Primachev/Frasinyuk [5-8], are devoted to the solution of this problem.

## AIMS AND OBJECTIVES

The purpose of the article is to clarify two management problems in the system of the marine transport industry. One problem is due to the actual increase in efficiency external to the maritime transport industry. It is due to an increase in the quality of transport services for cargo flows and optimization of the environmental impact of the fleet and ports based on the growth of shipbuilding capital intensity. The second problem is to achieve the normalized efficiency of the operator activity of the merchant marine fleet of marine states, regardless of the degree of concentration of the carrying capacity of the national fleet.

The international division of labor as an external environment, which determines the need for increasing the carrying capacity of the merchant fleet, predetermines a change in the positioning strategy of individual ship owning structures [5].

For any shipping company, the fleet's carrying capacity is concentrated in local areas. The quality of operator management, taking into account the traditional imbalance of deadweight and cargo flow parameters, becomes important for them. A focus on bareboat charter technologies, as shown by the negative experience of transferring Ukrainian vessels, can aggravate the situation due to the increase in ship repair costs, for which the contract time is over. Due to the increase in depreciation and delayed repairs, the operators of the shipping companies of Ukraine subsequently actually lost their functions in connection with the redemption of vessels by new shipowners.

One of the principles for the development of the country's marine transport industry should be considered as an orientation to the prospective growth of participation in the international division of labor as an element of the socio-economic activity of the state and business structures. The prospect of increasing the role of maritime transport in the global maritime trade market should be taken into account by the national economy, focused on expanding the scope of services of the specialized transport fleet. Unfortunately, from this point of view, most ports of Ukraine are not competitive to participate in integration strategies at a technical and economic level. Only in the waters of individual ports and industrial enterprises, there are territories that could be used according to the principle of transshipment. But this is also the reason for considering the expediency of using mixed navigation vessels calling at a commercial port. Such objects of specialization in export-import operations, taking into account a number of measures, become competitive in maintaining route sections of the global multimodal project. In addition to the organizational and technical problems of the development of the marine transport industry, administration and regulation are distinguished. In this regard, the amount of taxes and fees should take into account the financial plans of certain types of activities, taking into account other macroeconomic results. Targeting taxation is the ability of the system to take into account the influence of certain types of activities on the development of other objects that form employment in the labor market. In this regard, the shipping business, based on the principles of intermodal communications, has an impact on the multi-level formation of value added.

In this aspect, the main purpose of research is the systematization of conditions to achieve the parameters of transport independence within the development of international transport integration. Special attention is paid to the selection of the mission, based on the formation of the system of Merchant Shipping, which provides a normalized efficiency. This, in turn, must be achieved by the advantages of innovative cargo transportation technologies.

## METHODS

In the process of conducting the research, a set of general scientific and special methods was used to reveal the set tasks. In the process of research, the method of system analysis, system-structural method, analytical method, comparative method was used.

The theoretical and methodological basis of the study are the basic provisions of economic theory, macro- and microeconomics, scientific works of domestic and foreign scientists on regulating the development of maritime transport, legislation and other regulations on the formation of a specialized maritime transport fleet.

## RESULTS

The objectivity of the economic situation lies in the fact that companies whose fleet is in various phases of the life cycle are engaged in functional activities. Thus, a significant differentiation of competitiveness and the effectiveness of the provision of transport services in local areas is formed [9]. At the same time, the level of requirements for the quality of the shipping business is constantly increasing. Increased costs reinforce the requirements for reducing links with low profitability [10]. If there is a lower efficiency segment, it is necessary to manage the narrowing of this segment but also pay solvency in various shipping regions.

The tariff rate, as a normal performance management tool, taking into account the theory of balance of the selected market segment, should not be considered as a production target. Unfortunately, this approach to the arbitrary establishment of the level of tariff rates and fees has made the movement of transport vessels within individual routes problematic.

The attraction of alternative sources of investment resources on the basis of concluding contracts for the transportation of goods of foreign trade in accordance with the custom of balance is considered as a fundamental approach to the formation of a national merchant fleet. Without resorting to the quota model, this allows you to create a zone of priority lending to merchant shipping at affordable price characteristics. The reserve is the use of the interest of cargo owners, freight forwarders and traders in the implementation of projects to jointly increase the deadweight of a specialized fleet. After the beginning of the concentration of competitive carrying capacity, it becomes possible to implement traditional financing tools. These are bank loans, collateral technologies and the creation of corporate ship owning structures.

The aggregate effectiveness of the normalized development of the fleet includes direct and non-systemic results, among which there are the increase in profit of the shipbuilding complex, the increase in profit of shipping companies and trading ports, the effect of manufacturers on improving the quality of transport services for cargo flows and the effect of reducing the industrial load on nature.

$$\Delta E_s = e_n K_{ps} + \Delta Q_s (p_{cs} - c_s) + \Delta Q_g n_{wk} (1 - i_t) + N_l (c_{sn} - c_{sl}) \quad (1)$$

where  $e_n$  – the rate of profit of the shipbuilding complex, providing replenishment of the fleet of the marine transport industry;  $K_{ps}$  – the value of the fleet built at the shipyards of the country;  $\Delta Q_s$  – increase in freight traffic by the relevant fleet;  $p_{cs}$  – freight rates of the maritime trade market;  $c_s$  – transportation cost of one ton of cargo by this fleet;  $\Delta Q_g$  – the value of cargo for which has accelerated delivery of the commodity mass, forming the current enterprise funds;  $n_{wk}$  – working capital ratios for goods in transit;  $i_t$  – index for reducing the time of cargo delivery to the consumer;  $N_l$  – parameters of the natural potential subject to anthropogenic pressure by the activities of maritime transport;  $c_{sn}$  – the positive effect of optimizing the relationship of sea transport to the natural environment;  $c_{sl}$  – additional costs of maritime transport enterprises due to the implementation of environmental protection standards.

The main task of a shipping company in the current conditions of unbalanced growth in cargo flows and the deadweight of the merchant fleet is the implementation of four basic principles for serving the needs of world trade: accessibility, comprehensiveness, timeliness and reliability.

Ensuring the effective functioning of the main link of the transport complex, i.e., a shipping company, involves the development of direct and feedback links with the activities of service enterprises. This makes it necessary to clearly integrate management and balance the activities of other units. The complex nature of the functioning of the transport business segment is to form the consumer value of the product and the efficient use of economic resources of all market participants. Orientation to strategic goals actually ensures a reduction in the degree of risk of operator activity according to the criteria of maintaining the life cycle at a competitor level.

Moreover, among strategic goals, one should consider both traditional ones - maximizing profits, sustainability of financial support for innovative projects, and long-term positioning and timely differentiation, ensuring capitalization and maintaining jobs. To select the directions and parameters of the formation of the national segment of the transport business, it is necessary to justify the strategy in specific indicators. The structure of domestic production should be determined on the basis of prevailing and promising growth rates and proportions. After that, the main factors of the development of individual units of the marine transport industry are specified taking into account the level of intensification of production. Priority areas of economic and technical solutions, taking into account state and business resources, are chosen on this basis.

The reflection of the variability of the conditions for the formation of cash flows becomes fundamental in the decision-making system regarding the positioning of specialized shipping companies. Particular attention is drawn to the concept: "The discount rate, also known as the cost of capital or the required rate of return, reflects risk, which is uncertainty" [8]. This determines the change in the current conditions for the formation of the price component of intermodal technologies for the delivery of goods.

It should be borne in mind that specialized shipping companies in their activities are guided not only by the natural needs of the national or regional economy in the movement of resources and products but also create special complexes that form new needs for marine technologies. The problem of optimizing the time and cost of shipowners and the sphere of consumption of transport services arises in this aspect. The task of shipping companies is to optimize the real flow of money during transportation. At the same time, the problem of the adequacy of the cost and the assessment of the usefulness of time spent on a particular trip (route) arises for cargo owners and passengers.

The central objective of any commercial enterprise is considered to be the management of the value of fixed capital, taking into account the "weighted average costs" and capitalization [8, 11, 12]. The fair market value of the fleet depends on the structure of the investment support of the development project and on the state of the capital market in the marine industry. The following components of the market value of capital ( $K_{pm}$ ) of a commercial enterprise are usually taken into account.

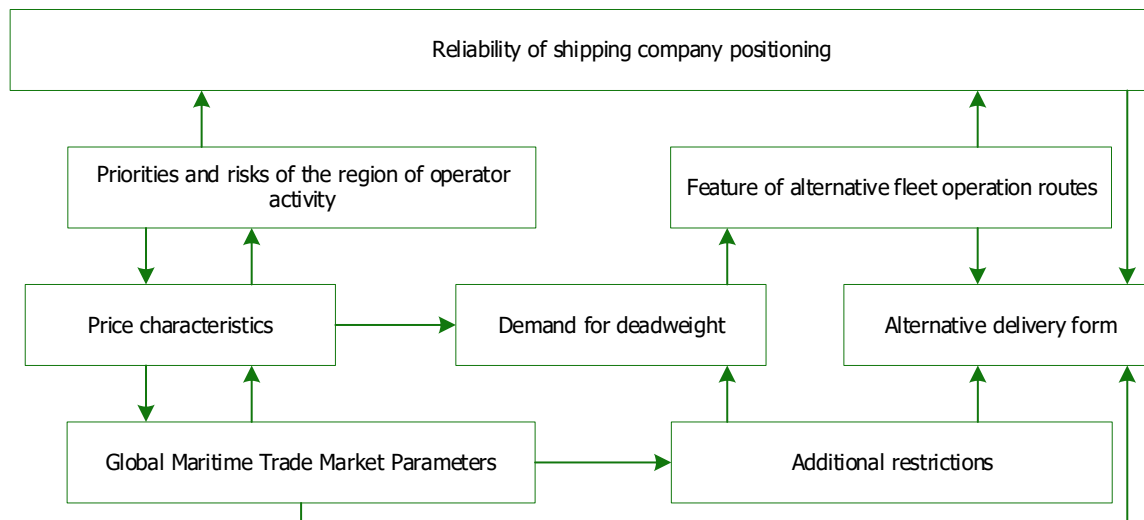
$$K_{pm} = \frac{R_{vcr} - K_{pcr}(p_{ck} - l_q)}{e_{ak} - l_q} \quad (2)$$

where  $R_{vcr}$  – net cash flow due to the implementation of the investment program (shipping company development project);  $K_{pcr}$  – the total loan capital used in the implementation of the fleet replenishment project;  $p_{ck}$  – interest rate adjusted for the tax regulation of the economy, per unit of capital cost;  $l_q$  – forecast the average annual growth rate of the economic result over the course of the implemented credit strategy;  $e_{ak}$  – the standard of efficiency of capital assets received by the enterprise for its own funds.

This method of assessing the effectiveness of the use of credit resources reduces the risk of excessive debt. The demand for capital as a factor in the development of any segments of merchant shipping since the beginning of the 21st century has reflected a drop in the marginal profitability of the carrying capacity of the fleet of shipowners. Under these conditions, the insufficient activity of the Ukrainian merchant fleet led to the outflow of foreign exchange resources for chartering foreign tonnage. Ignoring the use of Ukrainian river ports has increased the load on roads in the export of grain to seaports. The decrease in the role of the transport fleet is due to the absence of an increment in the marginal productivity of one ton of cargo capacity of the vessels and has led to the cost of buying foreign grain carriers and to critical deterioration of roads.

Positioning stability management in any segment of transport activity reflects a system of principles (Fig. 1) and methods for developing investment and managerial decisions that are aimed at ensuring the efficient use of production potential based on the value of services for consumers [6]. The main attention should be focused on the tasks of current stability and on the evolution of a specialized fleet.

The development of shipping in the local space is based on the theory of evolution using innovative solutions at individual stages (Fig. 1). If this condition is violated, signs of an imbalance of the complex are formed with a subsequent increase in direct costs and a decrease in value for consumers of transport services. Firstly, the growth in freight traffic must be taken into account at the basis of the growth in carrying capacity. Secondly, under the priority influence of external conditions of evolutionary development of the local segment of the maritime trade market, it is necessary to take into account the internal activity of individual investors. In the economic development of specialized maritime transport, it is necessary to pay attention to the fact that the work of the respective seaports regarding the transportation and maintenance of cargo flows acquires the characteristics of "complementary goods" [13]. And this principle also affects the pricing and specialization of ships and ports.



**Figure 1. A system of the interdependence of structural elements of merchant shipping.**

In this regard, the entire north-western region should be considered the local zone of sea and inland water transport in Ukraine. Two conditions are required: the development of infrastructure for processing cargo flows and the creation of a special fleet. This is reinforced by the need to connect the New Silk Road project. Unfortunately, in the context of the inconsistency of the use of port water areas and the creation of competitive terminals, there remain conflicting relations in accordance with international standards and the external environment of intermodal service.

As a prospect for the development of specialized shipping, one should consider the features of developing alternative routes in the "One Belt - One Way" initiative, which is forming new approaches to choosing an alternative to positioning the merchant fleet. The increasing role of the maritime transport industry and its special type of specialized shipping, taking into account its influence on the social and economic aspects of the development of macroeconomics, requires the use of state coordination in terms of balancing the totality of interests. The main aspect is the optimization of fleet maintenance and the functioning of a fair seafarer hiring system [7].

In the system of managing the results of the marine transport business, it is necessary to distinguish between the sequence of stages of increasing costs and a certain delay in the flow of corresponding income. Then the period of a steady excess of income over costs begins. But you should take into account the seasonality of the formation of both costs and results. In this regard, the problem is the stability of a load of economic potential throughout the entire planning period.

The parameters of the pre-crisis and post-crisis economic development of merchant shipping confirm the position that in order to maintain a leading position, it is necessary to ensure a level of economic growth of at least 4.5 percent. For shipping companies, this can be achieved through high-tech processes of functional activity and the technical management of advanced service. In this aspect, one should agree with the provision: "The strategic thinking of the leadership is expressed in various planning documents ..., this integration process is largely based on budgetary procedures" [14]. This emphasis predetermines a strict balance of cash flow management designed to maintain operational competitiveness, on the one hand, and maintain technical reliability and safety of operation of the vessel, on the other.

At the same time, national programs should include the implementation of appropriate investment projects [10]. Taking into account the regularity of a faster increase in container flows relative to other cargo groups, despite the high development costs of this type of intermodal communication, the determination of the allowable costs of the initial period of the shipping company's entry into the competitive space should be considered as the most important condition for capacity building.

## CONCLUSIONS

In the system of shipping companies, the principle of stability of positioning is minimized while minimizing changes throughout the project life cycle. However, changes are shaped by the freedom of entry of new competitors. In any case, due to the conservatism of the structural changes of the merchant fleet vessels, from all the possible options for transforming the base state, one is implemented that allows you to adapt to new conditions while minimizing capital costs [15]. It is the

normalized transformation based on innovative solutions that ensure the efficiency of the functional activities of well-known specialized shipping companies.

At the same time, the various life cycles of individual objects of the transport complex form not only the value of current costs for the reproduction of advanced capital [9] but also suggest the need to manage competitiveness parameters when new innovative technologies appear. It is important to prevent the loss of capital value in the event of a period of inadequacy according to the criteria of consumer properties, despite the operability of ships and coastal facilities.

The post-industrial stage of development of individual countries determines the need to choose a development strategy or to maintain positioning parameters in a promising segment of high-tech production. In Ukraine, in addition to aircraft and rocket engineering, this is the remaining potential of shipbuilding. However, the competitiveness of shipbuilding yards in the Asia-Pacific region does not allow us to hope for the sustainability of the Ukrainian shipbuilding industry without focusing on national shipowners. There remains a niche of special vessels and, above all, sea-river vessels, passenger and ferry, the segment of which is expanding significantly. It should be borne in mind that in this specialization, the main suppliers are European shipyards, including Finnish ones.

The variety of constraints implies the development of a balanced scorecard [16-18], which should be weighted according to risk management criteria. The main thing is the analysis of factors contributing to the optimization of the final indicators with the parameters of the maritime trade market. Therefore, all planned tasks are evaluated according to the criteria of compliance with the implementation of the strategic goal and reducing the likelihood of risk.

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*Голубкова І. А., Фрасинюк Т. І., Бабаченко М. В., Яворська А. Ф., Левинська Т. І.*

## **ОСОБЛИВОСТІ ФОРМУВАННЯ ОСНОВНИХ ПАРАМЕТРІВ СПЕЦІАЛІЗОВАНОГО МОРСЬКОГО ТРАНСПОРТНОГО ФЛОТУ**

У статті розглянуто основні принципи оптимізації стану підсистем галузі морського транспорту. Оскільки позиціонування управління стабільністю в будь-якому сегменті транспортної діяльності відображає систему принципів, була виділена система взаємозалежності структурних елементів торговельного мореплавства. З урахуванням найважливіших положень управління економічною стабільністю судноплавства та принципів обслуговування потреб світової торгівлі, розглянуто актуальні проблеми вдосконалення оцінки господарських рішень за критеріями та показниками, що відображають функціонування судноплавних компаній і торговельних портів. Представлено структуру проблем і переваг формування активної морської транспортної стратегії. Розкрито деякі фактори розвитку спеціалізованих сегментів світового ринку морської торгівлі. Сформульовано закономірності та умови формування параметрів морського транспортного кластера. У статті розглядаються заходи щодо збалансування економічних інтересів морського транспорту та його споживачів. На цій основі посилюється економічне стимулювання оптимальних економічних результатів. Розглянута необхідність використання ширшого спектра економічного регулювання, порівнюючи з концентрацією зусиль на одній моделі при оптимізації базового стану регіонального комплексу морського транспорту. Також у статті враховується аналіз факторів, що сприяють оптимізації підсумкових показників із параметрами ринку морської торгівлі. Виділяються особливості інноваційних підходів, що мають принципове значення в транспортному бізнесі та відображають інтелектуальну власність керівництва компанії або її консультантів. Саме на ідеях життєвого циклу суден транспортного флоту можна досягти функціональної та фінансової стійкості позиціонування, незважаючи на те, що з певною періодичністю з'являються нові конкуренти. Рекомендовано систематизувати умови досягнення параметрів транспортної незалежності в рамках розвитку міжнародної транспортної інтеграції, зазначено надання особливої уваги вибору місії на основі формування системи торговельного мореплавства, що забезпечує нормовану ефективність. Це також повинно досягатися перевагами інноваційних технологій перевезення вантажів.

**Ключові слова:** спеціалізація, параметри, вартість капіталу, ефективність, торговельний флот

**JEL Класифікація:** F29, P45, R49