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THEORETICAL BASIS OF MARITIME TRANSPORT MARKETS MANAGEMENT IN MODERN CONDITIONS OF UNCERTAINTY

Serhii Kramskyi 

PhD in Engineering, associate professor,
associate professor of the Department of Public Management and
Administration
Odesa I. I. Mechnikov National University, Ukraine

Oleksandr Darushin 

PhD in Economics, Doctoral student,
Institute of Economics, Management & Business
Odessa National Technological University, Ukraine

Summary. *In accordance with the logic of the methodology of maritime logistics, as well as the basic provisions of the theory of transport processes and systems, and management theory, the conceptual system of the formation of uncertainty factors in the management of vessel operations has been analyzed, which provides for the integral unity of a set of production and management technological processes in shipping. The authors of the study substantiated the legitimacy of using probabilistic approaches to taking into account the uncertainty of the operating conditions of maritime transport. The authors established that the consideration of the influence of uncertainty factors on the results of the economic and production work of the vessel is differentiated and depends on the level of management and comprehensive consideration of the problem - within the annual period of time or within a specific voyage of the vessel.*

Key words: *transport services market, uncertainty, chartering, cargo transportation, sea vessel, risk for shipowners.*

Introduction. Currently, the war between Russia and Ukraine is in its third year of continuous operation, which has a rather negative impact on the country's maritime industry and maritime shipping. The obtained regularities allowed us to formulate an expression for the deviation of the efficiency indicator of the vessel's voyage performance as a function of the vessel and voyage characteristics. Thus, the problem of ensuring the efficiency of a sea vessel's voyage is considered, taking into account possible deviations in the voyage time and the cost of the bunker, as the main risk factors in the process of sea transportation. A calculation formula for the voyage efficiency indicator (time charter equivalent) is proposed, taking into account possible deviations in the considered parameters, which, in turn, were determined on the basis of a probabilistic approach.

Analysis of previous studies and statement of the problem. Even in a low freight market (in conditions of minimum freight rates for cargo transportation), many sea carriers operate quite efficiently, which is explained by

the presence of a stable cargo base [2, 3]. Conversely, shipping companies, in order to cover all their costs, need to achieve the main objectives of vessel operation. There are several problems with this. The first problem: cargo flows traditionally served by sea vessels, even with stability, are subject to fierce competition. Therefore, the management of shipping companies needs a high level of professionalism and reliable connections with brokers, forwarders and cargo owners to provide the fleet with a cargo base [5, 6]. The second problem: long-term contracts for transport provision (for example, consecutive voyages (CV) - a contract for transportation by consecutive voyages, volume contract or contract of affreightment (COA) - a contract for the transportation of a certain amount of cargo) have a significant number of commercial aspects, which at the time of signing these contracts already entail many risks for shipowners.

Research goal and objectives. Analysis of maritime transportation and shipping services management markets in current conditions of uncertainty.

Main part. Maritime transport plays an important role in facilitating global trade. Although some trade relations have replaced land transport, most trade relations would not be possible without maritime transport. Moreover, in the context of globalization and the international division of labor in production, some forms of production would not be possible without transport services, including maritime transport. Uncertainty is a property inherent in all types of transport in various aspects - uncertainty of the conditions of production processes, uncertainty of commercial conditions, etc [1]. Therefore, issues related to taking into account uncertainty in certain aspects of managing the work of transport enterprises and organizing transport production are the subject of research by many modern specialists in various transport areas. Figure 1, shows the dynamics of world trade.

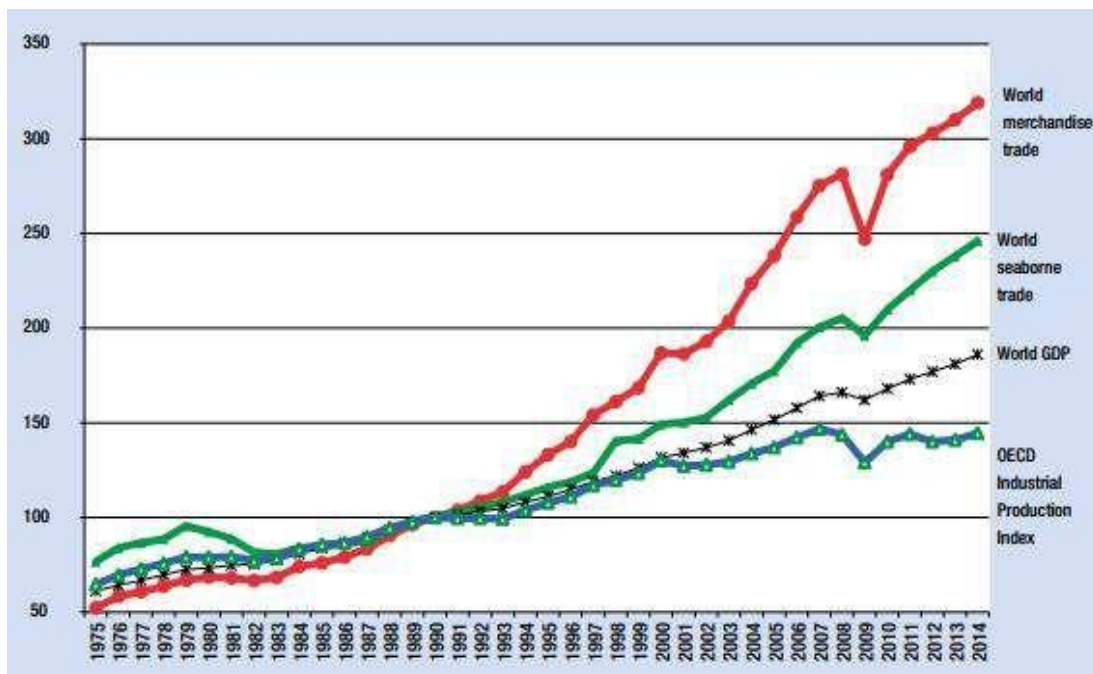


Fig. 1. Fragment dynamics of the OECD index
data generated from [9]

In figure 2, presents an analysis of the dynamics of world trade by cargo category. As we can see, even the declines in world trade in 1990 and 2022 did not

lead to a drop in volumes to the level of, for example, 2024. Thus, despite some objective adverse changes, world trade on average shows an increasing trend [8].

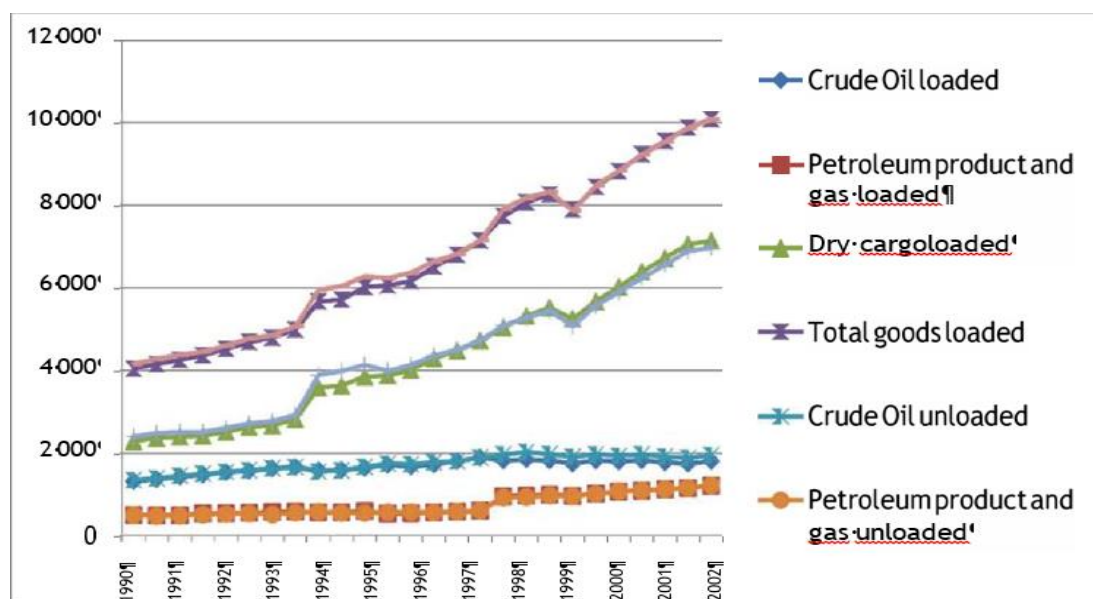


Fig. 2. Dynamics of world trade by cargo categories, million tons.
 data generated from [7]

More than two-thirds of the total volume is accounted for by sea trade. As can be seen from the figure, the most volatile is the volume of so-called dry bulk cargo, which is mainly transported by bulk carriers, multi-purpose vessels and, to a lesser extent, container ships. The structure of world sea trade in 2024 is shown in figure 3 (the term “sea trade” is used in all statistics). (The term “sea trade” is a stable expression used in reports (e.g., [9, 10]) to refer to goods delivered by sea transport). In a regional context, Asia is the leading exporter and importer, with a share almost twice that of the United States (figure 4). This trend has continued over the past 7 years. Of all regions, Europe has the best balance between exports (transit) and imports (transit) cargo.

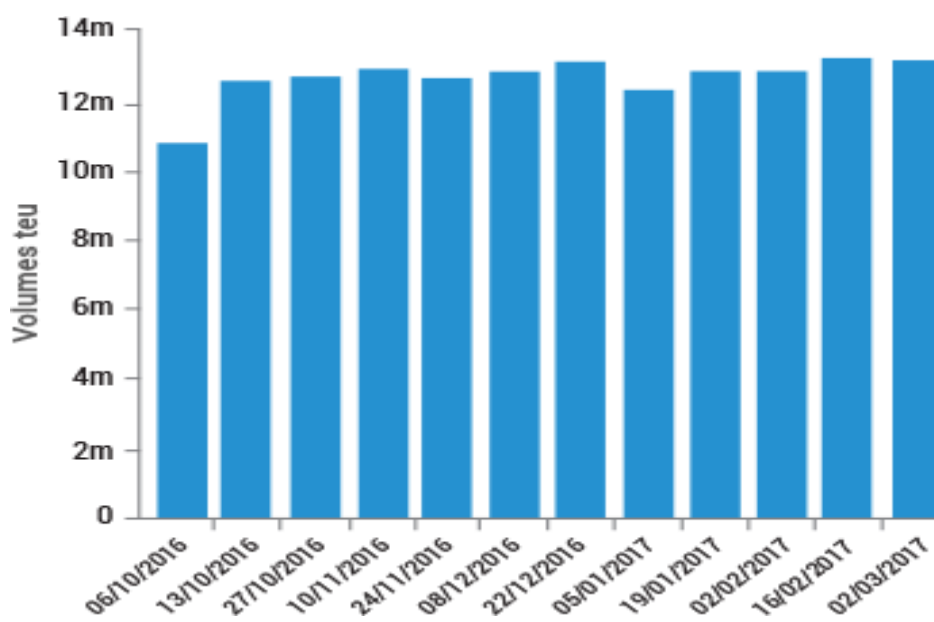


Fig. 4 Retrospective dynamics of world trade cargo volumes, in 2016-2017.

In figure 5. shows a comparative characteristic of container carrier companies (by container fleet capacity, TEU), with the share of orders for new vessels (orderbook) highlighted. It should be noted that the aging of ships has a significant impact on the efficiency of maritime transportation, and in some cases on the provision of transport services. It should be noted that shipbuilding based on free-of-charge ships is now widely practiced in Ukraine [11, 12], and this allows for the most efficient use of old hulls that have reached the end of their service life. The main options for linking the project life cycle with the product life cycle, which is a key issue in proactive project marketing, are analyzed. A conceptual model of fleet renewal project success management based on proactive project marketing has been developed.

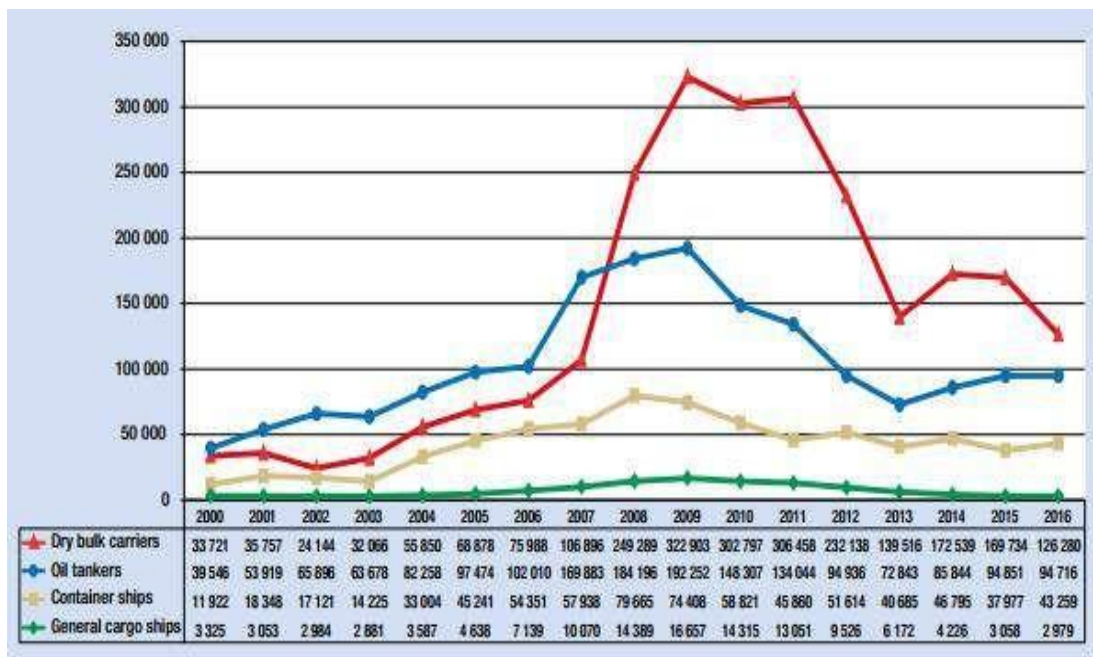


Fig. 5 Retrospective ship orders, thousand deadweight tons
data generated from [7]

For example, in many developed countries, the import of vessels older than a certain age is prohibited by law. Therefore, even if there is a demand for transportation and the price is acceptable to the shipowner, the shipowner is forced to refuse to operate the vessel, since it is forced to enter ports under such conditions. This situation is due to changes in the field of maritime safety in Ukraine and abroad. The International Maritime Organization (IMO) is constantly improving the existing regulatory framework for maritime safety, which leads to the emergence of new rules that require shipowners to comply with the regulatory service life of vessels. However, it should be noted that many vessels operating in the Black Sea region and carrying out transportation between the ports of Ukraine, Bulgaria, Romania, Georgia, Turkey. Turkey are operated much longer than their nominal service life and bring great benefits to shipowners [13]. Container shipping, one of the sectors of world trade supported by maritime transport, has continued to show positive growth in recent years, the crisis being the only exception; APM Maersk remains the industry leader with a fleet exceeding 3.5 million TEU, including

newbuilding orders from 1990 to 2024. The tanker and bulk carrier fleets represent roughly equal shares of the world fleet, although the gap between them has widened to 20% since 2022.

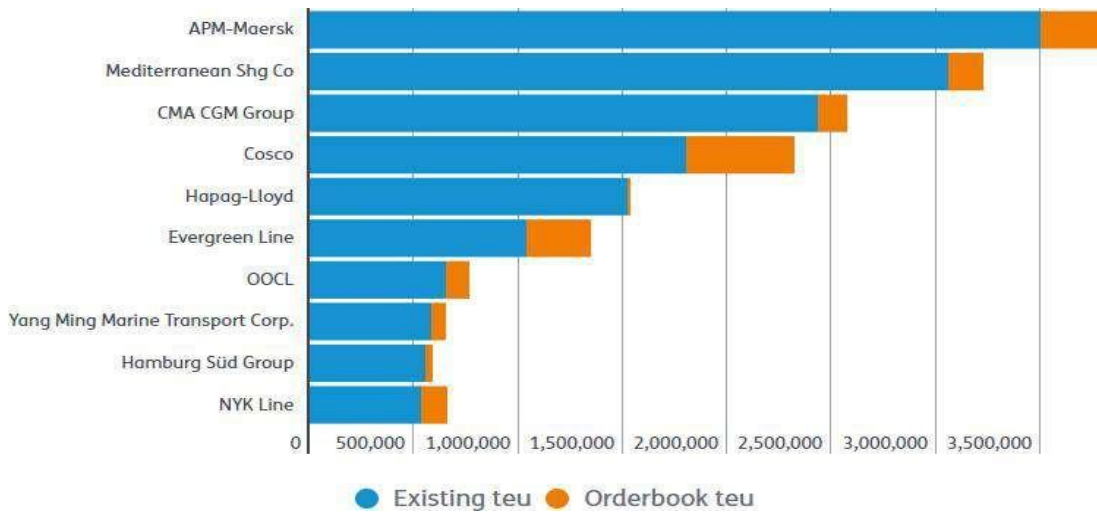


Fig. 6 Container capacity of the fleet of major container shipping companies, TEU
 data generated from [7]

Thus, the freight market, the ship trading market and the shipbuilding market are closely interconnected (Fig. 6.). The change in the composition of the specialized fleet corresponds to trends in world trade in different types of cargo, and new ships figure 5, help to compensate for the discrepancy between the current composition of the fleet and the demand for ships in different specialized sectors. However, it is not only the changing dynamics and structure of world trade that determines the need for new shipbuilding. Sooner or later, all means of production need to be modernized. For companies operating in the maritime sector, the means of production are the ships that make up the fleet. The average service life of a vessel is 25-30 years, but modernization and reconstruction can extend this period.

However, this situation is exceptional and is explained by the fact that these vessels are bulk carriers or multi-purpose vessels, which, due to their design, technical and operational characteristics, are much easier to operate safely than, for example, container ships or tankers. Moreover, depending on market conditions, they can be disposed of before the end of their regulatory service life. For example, this happened after the global economic crisis that began in 2008. For reasons such as low productivity, some shipowners decided that the disposal of their vessels was more profitable than paying fixed costs and not receiving freight (income) from operation [14]. At the same time, there was a large supply of vessels on the market (including new ones), so it did not make sense to sell them. Interested parties who took the opportunity to purchase vessels could have purchased new buildings at a much lower price under current conditions. Therefore, it is expected that many 20-25-year-old vessels will neither be operated nor sold during the analyzed period (this was noted in a number of analytical reviews of the shipping market, for example, [15, 16]).

Conclusions. Based on the scientific & theoretical results of this study, the following conclusions can be drawn: 1. The main factors influencing the fleet renewal process are: freight market trends, transportation volumes in already developed markets, opportunities to enter new markets, ship prices and the competitive

environment. The main strategic goals that determine the need for fleet renewal have been identified. It was recognized that “fleet renewal projects” differ from “ship acquisition projects”, and the corresponding goals and cash flow generation characteristics for these two categories of projects have been identified.

2. Fleet renewal options include shipbuilding, ship purchase, bareboat charter and time charter. For each type of fleet renewal project, the main classification characteristics, life cycle details, costs and participants are defined. Project marketing is a prerequisite for the success of the project. Market research in fleet renewal projects is the basis for making most decisions regarding the content of the project. Given the role of marketing research in fleet renewal projects, this research is proactive in nature and is aimed at identifying promising factors for the success of the project. Markets for fleet renewal projects and marketing research are the results of the project and include fleets with: fleets of a certain specialization and range of carrying capacity; fleets of a certain specialization and different carrying capacity; fleets of different industries; fleets of a certain specialization; fleets of a certain specialization and range of carrying capacity.

3. Taking into account the specifics of fleet renewal projects, project success management based on proactive marketing is related to content management, cost management, time management and control, risk management and risk management. Cost management, time management and risk management are also related to most areas of knowledge in project marketing. The essence of proactive project marketing is to implement proactive marketing efforts to determine the parameters of content, time, cost and risk management for a successful project. Based on the analysis of the main types of vehicle renewal projects, the content of the set of marketing research tasks within the vehicle renewal project and their distribution by life cycle stages and areas of expertise have been determined.

4. Based on proactive marketing, the main guarantees of project success are target and time parameters. Although targets characterize the project product, time is also an important phase of the project life cycle. The dynamics of the market environment for vehicle revitalization projects show that the parameters of a vehicle revitalization project have a complex impact. The assessment of market dynamics became the basis for determining the optimal project parameters (parameters that guarantee the best results for the selected category of vehicle revitalization projects in the current market situation).

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ТЕОРЕТИЧНИЙ БАЗИС УПРАВЛІННЯ РИНКАМИ МОРСЬКИХ ТРАНСПОРТНИХ ПЕРЕВЕЗЕНЬ В СУЧАСНИХ УМОВАХ НЕВИЗНАЧЕНОСТІ

Крамський Сергій Олександрович

кандидат технічних наук, доцент

доцент кафедри публічного управління та адміністрування

Одеський національний університет імені І. І. Мечникова, Україна



Дарушин Олександр Володимирович

кандидат економічних наук, докторант,
інституту економіки, управління та бізнесу
Одеський національний технологічний університет, Україна

Анотація. Відповідно до логіки методології морської логістики, а також базових положень теорії транспортних процесів та систем, теорії управління, проаналізовано концептуальну систему формування факторів невизначеності в управлінні роботою суден, яка передбачає інтегральну єдність множини виробничих і управлінських технологічних процесів в судноплаванні. Авторами дослідження обґрунтована правомірність застосування імовірнісних підходів до врахування невизначеності умов експлуатації морського транспорту. Авторами, встановлено, що розгляд впливу факторів невизначеності на результати економіко-виробничої роботи судна є диференційованим і залежать від рівня управління та комплексного розгляду проблеми - в межах річного проміжку часу або в межах конкретного рейсу судна.

Ключові слова: ринок транспортних послуг, невизначеність, фрахтування, перевезення вантажів, морське судно, ризик судновласників.