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STUDIES ON MARITIME TRANSPORT: A BIBLIOMETRIC ANALYSIS (2010-2023)

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ABSTRACT

Maritime transport serves about 80% of world trade among transport modes and is of great importance for the global economy as it has a great impact on economic development. The aim of this study is to examine the studies on maritime transport between 2010-2023 by bibliometric analysis method. For this purpose, the Web of Science database was searched using the terms "maritime transport", "waterway transport", "sea transport" and 574 publications with this term in the title were found. These publications were then filtered as articles and 395 article studies were visualised and interpreted using VOSviewer mapping method. It was observed that the highest number of publications in the time period considered was in 2023 with 48 publications. Following the analysis, "maritime transport" was the most used keyword, appearing 81 times. Kum Fai Yuen (5 publications, 176 citations) and Harilaos N. Psaraftis (5 publications, 132 citations) are the researchers with the most publications, co-authorship, and citations. With 43 publications, China is the nation with the most publications. Once more, with 570 citations, China is the most referenced nation. TransNav: International Journal on Marine Navigation and Safety of Sea Transportation is found to have the highest number of publications (24 publications). This study reveals the current status and trajectory of maritime

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transport literature and in this context, the study is expected to guide the researchers who will work in this field.

Keywords: *Maritime Transport, Trade, Citation, Bibliometric Analysis, Visual Mapping.*

DENİZ TAŐIMACILIĐI ÜZERİNE YAPILMIŐ ÇALIŐMALAR: BİBLİYOMETRİK BİR ANALİZ (2010-2023)

ÖZET

Deniz tařımacılıđı, ulařtırma modları arasında dünya ticaretinin yaklaşık %80'ine hizmet etmektedir ve ekonomik kalkınma üzerinde büyük bir etkiye sahip olması nedeniyle küresel ekonomi için büyük önem taşımaktadır. Bu çalışmanın amacı, 2010-2023 yılları arasında deniz tařımacılıđı üzerine yapılan çalışmaları bibliyometrik analiz yöntemiyle incelemektir. Bu amaçla Web of Science veri tabanında "maritime transport", "waterway transport", "sea transport" terimleri kullanılarak arama yapılmıő ve bařlıđında bu terim geçen 574 yayın bulunmuştur. Bu yayınlar daha sonra makale olarak filtrelenmiő ve 395 makale çalışması VOSviewer haritalama yöntemi kullanılarak görselleřtirilmiő ve yorumlanmıőtur. Ele alınan zaman diliminde en fazla yayının 48 yayın ile 2023 yılında olduđu görölmüőtür. Analiz sonucunda en sık kullanılan anahtar kelime 81 kez kullanılan "deniz tařımacılıđı" (maritime transport) olmuştur. En fazla yayın, ortak yazarlık ve atıf sayısına sahip arařtırmacıların Kum Fai Yuen (5 yayın -176 atıf) ve Harilaos N. Psaraftis (5 yayın, 132 atıf) olduđu gözlemlenmiőtir. En fazla yayına sahip ülke 43 yayınlı Çin'dir. Yine en çok atıf alan ülke 570 atıf ile Çin'dir. En çok yayın yapılan derginin ise TransNav - International Journal on Marine Navigation and Safety of Sea Transportation (24 yayın) olduđu gözlemlenmiőtir.

Anahtar Kelimeler: *Deniz Tařımacılıđı, Ticaret, Atıf, Bibliyometrik Analiz, Görsel Haritalama.*

1. INTRODUCTION

Following the Industrial Revolution, countries sought new ways to procure raw materials and other materials for production and to sell their surplus products to foreign markets, which led to significant developments in international trade (Öçal, 2023: 354). Businesses competing in the global market have had to develop international strategies to cope with the challenges of global marketing. As a subsystem of the logistics system,

transport is considered to be the most important element in logistics costs. At this point, an efficient and cost-effective transport system to gain competitiveness in international markets contributes to greater economies of scale in production and lower product prices (Cerit, 2000: 49-50). While the globalisation of trade enables countries to increase their competitiveness and get a larger share from world trade, it also provides consumers with access to more affordable products by reducing production costs (Özekiciođlu et al., 2023: 2). On the other hand, the choice of transport mode in international trade is of great importance for enterprises and national economies to gain competitive advantage.

Maritime transport and supply chain management have become increasingly complex due to the development of economic globalisation (Chen et al., 2024: 1). The increase in world trade volume emphasises the importance of maritime transport, and at this point, ports, as an important component of this transport system, have become important with the increase in competition and cargo volume (Yorulmaz and Patruna, 2021: 118). Maritime transport is considered as one of the cornerstones of global trade and a large part of international transport is carried out by this mode of transport (Wendler-Bosco and Nicholson, 2020: 378; Fratila et al., 2021: 4). On the other hand, multimodal transport facilitates the transition between maritime and other modes, enabling a more efficient and economical transport process (Wendler-Bosco and Nicholson, 2020: 387). Maritime transport is preferred especially for long-distance transport and large quantities of products.

The maritime transport industry is a vital part of a nation's economic system because it is essential to the import and export of resources as well as the creation of job opportunities. Academic research in this field has been highly interested due to the significance of maritime transport on a regional and worldwide scale (Yan et al., 2021: 1). The aim of this study is to examine the studies on maritime transport by bibliometric analysis method and to provide detailed information on the subject for researchers who will study on this subject. Bibliometric analysis enables the identification of studies, researchers and countries in the researched subject and provides guidance for future scientific studies by showing the interactions between studies, researchers and countries related to the researched subject.

2. THE IMPORTANCE OF MARITIME TRANSPORT AND PORTS IN GLOBAL TRADE

Many human activities are carried out in the seas for economic, military, cultural and industrial purposes. The most important of these are maritime transport and port management activities. The main reason for this is that maritime transport is carried out at a lower cost than other modes of transport and has the capacity to carry more cargo at one time (Aygül and Bařtuğ 2020: 26). While maritime transport is considered as the key point of global trade, many other sectors also rely heavily on maritime transport as resources are transported to production centres. All activities related to maritime transport have a great impact on the economy and these activities affect many sectors directly or indirectly (Fratila et al., 2021: 1). Maritime transport and ports play a critical role in the functioning of the global economy as they are the basic building blocks of international trade. By providing services such as storage and handling, ports facilitate the transfer of cargo between ships and contribute to the efficient functioning of supply chains.

As an important node in the international supply chain and maritime transport, ports make a significant contribution to the development of international maritime trade, but they also bring with them concerns about risk and disruption, especially in these areas, which are characterised as bottlenecks of all flows (Huang et al., 2022: 1). Ports provide a variety of complex services as the connection point between land and sea. However, due to the increasing volume of cargo, the services provided in ports may be disrupted from time to time (Yorulmaz and Patruna, 2021: 118). Global concerns, on the other hand, have an immediate impact on company operations and strain supply systems. Supply chain resilience has faced challenges from problems including the COVID-19 pandemic, geopolitical tensions, wars, and climate change (Li et al., 2023: 1). Trade flows and associated parties are also under pressure from these difficulties and disruptions (Lam and Su, 2015: 415). In the post-COVID-19 period, congestion at nodes has greatly affected maritime network performance (Huang et al., 2022: 1). Mańkowska et al. (2021: 1-2) state that the COVID-19 pandemic caused unique oscillations in maritime transit, which resulted in increased port congestion, rising freight charges, shipping delays, and supply chain disruptions. Furthermore, hundreds of millions of euros were lost when the 20,000 TEU cargo ship Ever Given blocked the Suez Canal for six days

in March 2021 (Gu and Liu, 2023: 1). On the other hand, wars and uncertainties may also have various effects on maritime transport. Because security concerns may cause changes in ship routes and increases in insurance costs.

As a result, maritime transport and the port industry are dynamic industries and are of critical importance in current global trade transactions (Noralam et al., 2020). Problems and delays at ports affect the efficient and smooth flow of goods through the main transport systems, which in turn affects global trade. Ports also contribute to more efficient and effective trade by supporting multimodal transport through the integration of other transport modes with maritime transport. Multimodal transportation refers to the transportation of a load from its origin to its destination using two or more modes of transportation. The transfer between the two modes is carried out at an intermodal terminal (Wendler-Bosco and Nicholson, 2020: 387). In summary, shipping and ports are indispensable for international trade and are important factors that help the global economy grow and remain sustainable.

3. METHOD, ANALYSIS AND FINDINGS

In this study, studies on maritime transportation were examined using the bibliometric analysis method. Bibliometrics is a statistical method that can perform quantitative analysis of research on a specific topic (Yu et al., 2020: 2). Bibliometric analysis is a widely used method for examining and analyzing large volumes of scientific data. This method summarizes existing or developing research topics by visualizing them (Kuzior and Sira, 2022: 4). Bibliometric images have a distribution consisting of the type of publication, the subject area studied, the country of the researcher, the journal in which the publication was published, and the language used (Nandiyanto and Al Husaeni, 2021: 2-3). This method allows the literature on the subject under study to be brought together efficiently and the relationships between selected publications to be examined.

Within the scope of this study, a search was made in the Web of Science database on 5 March 2024 with the concepts of "Maritime transport", "Waterway Transport" and "Sea Transport" and as a result of the scanning, 574 publications made between 2010-2023 and containing these concepts in their titles were reached. These publications were then filtered as articles and the resulting 394 article studies were visualized and interpreted.

The distribution of the number of publications reached according to the search terms used within the scope of the study is shown in Table 1.

Table 1. Types and Numbers of Publications to WoS Search Terms

Type	Numbers of publications
Article	394
Proceeding Paper	86
Book and Book Chapter	37
Other	57

Table 1 shows that 395 articles, 86 proceeding papers, 37 books or book chapters, and 57 studies in other categories make up the 574 publications on maritime transport. This study involved the filtering of article studies, as well as the visualization and interpretation of 394 article studies. The distribution of article studies according to years is as shown in Figure 1.

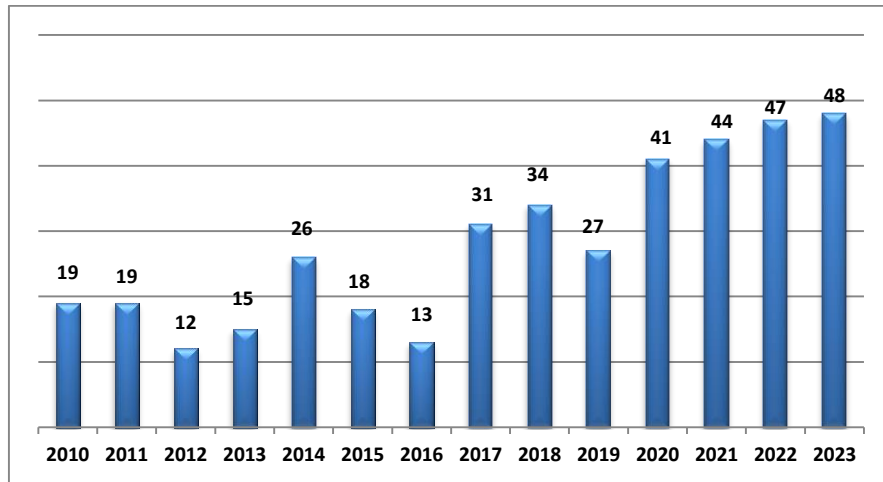


Figure 1. Distribution of publications by years

When Figure 1 is analysed, it is seen that the studies on maritime transport have tended to increase especially in recent years. The highest number of publications on the basis of years was realised in 2023 with 48 articles. The distribution of the studies according to WoS indexes is as shown in Table 2.

Table 2. Distribution of Publications According to Indexes

Web of Science Indexes	Numbers of publications
Emerging Sources Citation Index (ESCI)	133
Science Citation Index Expanded (SCI-E)	119
Social Sciences Citation Index (SSCI)	101
Other	42

When Table 2 is analysed, it is seen that 133 of the 395 article studies were published in ESCI, 119 in SCI-E and 101 in SSCI indexed journals. 42 articles were published in other WoS indexed journals. Figure 2 shows the distribution of keywords used in studies on maritime transport.

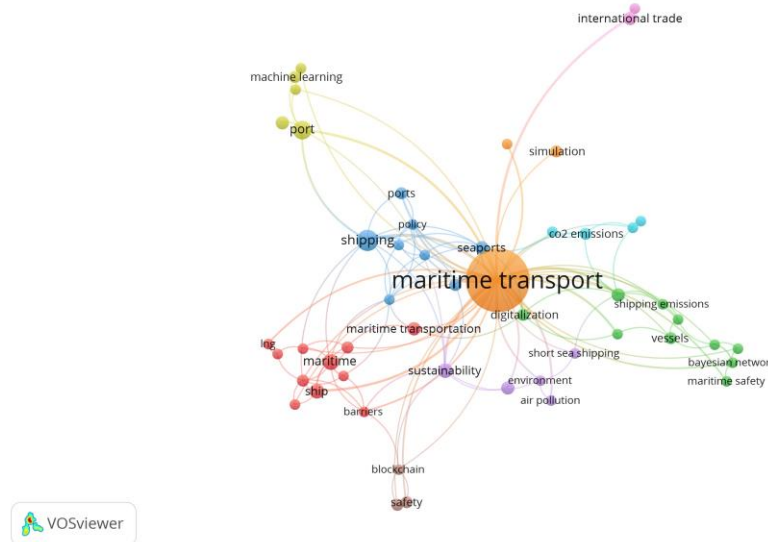


Figure 2. Most Frequently Used Keywords

There are 55 keywords used at least 3 times in 395 articles included in the analysis. The most frequently used keyword was maritime transport with 81 uses. The keyword shipping, used 19 times, ranks second in terms of frequency of use, while the keyword port, used 12 times, ranks third. The researchers with the highest number of authorship and co-authorship on maritime transport are as shown in Figure 3.

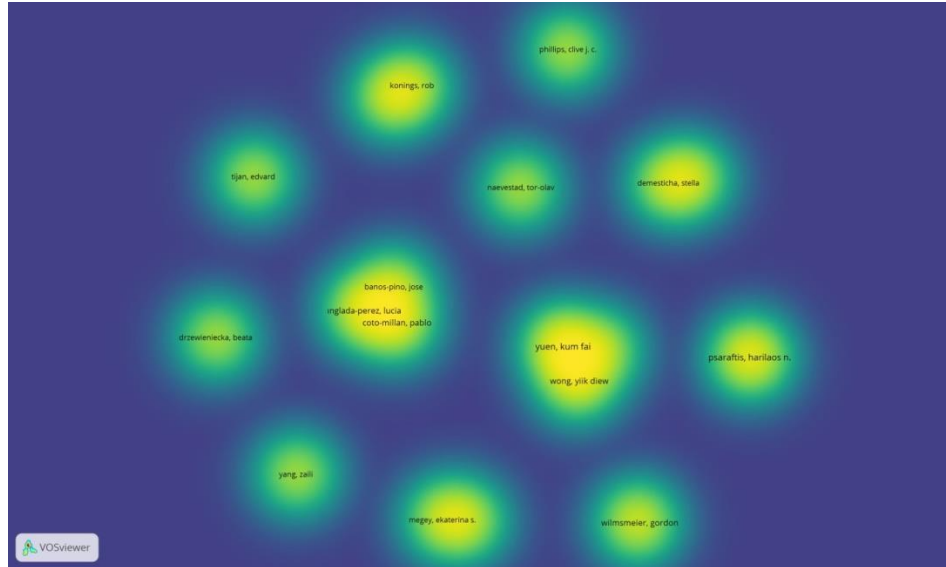


Figure 3. Researchers with the highest number of authorships and co-authorships

When the researchers' number of publications and citations had to be at least three, 19 authors fell inside the purview of the analysis. The amount of co-authorships is reflected in the color of the field containing the researcher names; authors with a predominately yellow color have a higher number of co-authorships. According to Figure 3, Kum Fai Yuen (5 publications, 176 citations) and Harilaos N. Psaraftis (5 publications, 132 citations) are the researchers with the most authorship and co-authorship in this area. Third place goes to Wong Yiik Diew (4 publications, 130 citations). Figure 4 displays the nations with the greatest number of publications on maritime transport.



Figure 4. Countries with the highest number of publications

There are 41 countries with at least 3 publications on maritime transport. Among these countries, China has the highest number of publications (43 publications). China is followed by Poland (41 publications), Spain (38), England (27 publications) and Germany (24 publications). The countries with the highest number of citations are shown in Figure 5.

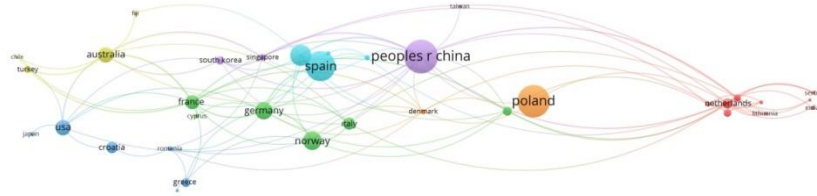


Figure 5. Countries with the most citations

Figure 5 shows that the country with the highest number of citations is China (570 citations). China is followed by Italy (494 citations), Norway (439 citations), England (377 citations) and Canada (374 citations). Finally, the journals with the highest number of publications on maritime transport are as shown in Table 3.

Table 3. Journals with the Highest Number of Publications

Journal Name	Number of Publications
TransNav - International Journal on Marine Navigation and Safety of Sea Transportation	24
Sustainability	15
Maritime Policy	13
Maritime Economics & Logistics	10
Transport Policy	8

When Table 3 is analysed, it is seen that "TransNav - International Journal on Marine Navigation and Safety of Sea Transportation" is the journal with the highest number of publications (24 publications).

Sustainability magazine (15 publications) ranks second, while Maritime Policy magazine (13 publications) ranks third.

3. CONCLUSION AND RECOMMENDATIONS

Maritime transport is critical for global trade. More than 80% of the world trade volume is transported by sea, making maritime transport the most important mode of transport for global trade. In this study, articles published in the international literature on maritime transport between 2010 and 2023 are analysed. In this context, 395 articles published between the relevant years and accessed from the Web of Science database were included in the scope of the study. This study offers a chance to assess the state of the literature on maritime transport as it stands today and its trajectory. The results of the analysis are summed up as follows:

- It is seen that the most publications were made in 2023.
- The most used keyword was "maritime transport" which was used 81 times. In the second place is the word "shipping" used 19 times and in the third place is the word "port" used 12 times.
- The two researchers with the most publications and the most co-authorship are Kum Fai Yuen and Harilaos N. Psaraftis with 5 publications.
- The most cited researcher is Kum Fai Yuen with 176 citations. Harilaos N. Psaraftis ranks second with 132 citations and Wong Yiik Diew ranks third with 130 citations.
- The country with the highest number of publications on maritime transport is China with 43 publications. In the second place is Poland with 41 publications and in the third place is Spain with 38 publications.
- The country with the highest number of citations is China with 570 citations. China is followed by Italy with 494 citations and Norway with 439 citations.
- The journal with the highest number of publications on maritime transport is "TransNav - International Journal on Marine Navigation and Safety of Sea Transportation" with 24 publications.

Due to its cost-effectiveness compared to alternative modes of transport, container transport by sea is suitable for the transport of significant quantities of cargo and thus promotes economies of scale.

Therefore, maritime transport is a suitable choice for both international and long-distance trade. Considering the scarcity of bibliometric studies in this field, it is anticipated that this study will serve as a resource for academics working in this sector and provide insight into the current status and future direction of maritime transport. This research also has some limitations. Within the scope of the study, only the studies in the Web of Science database were analysed. Future researchers can extend the research by including studies in databases such as Scopus and Ebscohost in the analysis. In addition, the Vosviewer programme used in the study only provides a visual map, future researches can use other advanced programmes that provide tables such as Rsdudio.

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