

Social and behavioral science trends in maritime studies: Keyword analysis

Denizcilik çalışmalarında sosyal ve davranışsal bilim eğilimleri: Anahtar kelime analizi

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Erdem KAN^{1,*} , Özgür TEZCAN¹ 

¹Çanakkale Onsekiz Mart University, Marine Science and Technology Faculty, Terzioğlu Campus, Çanakkale, Turkey

ABSTRACT

It is known that the maritime industry is intertwined with scientific developments. Considering the number of scientific research and support projects, the relationship between the scientific community and the industry is getting stronger day by day. The research aims to determine the main trend in the articles published between 2011-2022 in the journals published in the field of maritime management and indexed in SSCI-Social Science Citation Index. To determine the trend in the field of maritime management, the keywords of 1528 articles published in 3 journals determined according to the limitations were analyzed. As a result of keyword and network analysis, ports, maritime transport, liner shipping, container terminals, and data envelopment analysis-DEA are the most used keywords. The most important result obtained as a result of this study is that the events in the world (war, pandemic, terrorism, piracy, etc.) are in a rapid upward trend in the field of maritime business management and the scientific community has shown a rapid reaction on these issues.

Keywords: Maritime research, Keyword analysis, Social sciences, Trends, SSCI

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* (corresponding author)

E-mail: erdem.kan@comu.edu.tr

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ÖZET

Denizcilik sektörünün bilimsel gelişmelerle iç içe olduğu bilinmektedir. Bilimsel araştırma ve desteklenen proje sayılarına bakıldığında bilimsel camia ile sektör arasındaki ilişki her geçen gün kuvvetlenmektedir. Araştırmanın amacı, denizcilik yönetimi alanında yayınlanan ve SSCI'da indekslenen dergilerde 2011-2022 yılları arasında yayınlanan makalelerdeki ana eğilimi belirlemektir. Denizcilik işletmeleri yönetimi alanındaki eğilimin belirlenmesi amacıyla, kısıtlara göre belirlenen 3 dergide yayınlanan 1528 makalenin anahtar kelimeleri analiz edilmiştir. Anahtar kelime ve network analizi sonucunda limanlar, deniz taşımacılığı, liner taşımacılık, konteyner terminalleri ve veri zarflama analizi (DEA) en çok kullanılan anahtar kelimeler olarak karşımıza çıkmaktadır. Bu çalışma sonucunda elde edilen en önemli sonuç ise, dünyada yaşanan olayların (savaş, pandemi, terör, deniz haydutluğu vs.) denizcilik işletmeleri yönetimi alanı araştırmalarında hızla yükseliş trendine girmesi ve bilim camiasının bu konularla ilgili hızlı reaksiyon göstermesidir.

Anahtar sözcükler: Denizcilik araştırmaları, Anahtar kelime analizi, Sosyal bilimler, Trendler, SSCI

1. INTRODUCTION

In recent years, there has been a significant increase in the number of research and published articles on the maritime industry (Wang and Mileski, 2018). Due to the size of the seas in the world's ecosystem, it has an important place in people's lives. The hierarchy of management functions should carry out trade over the seas covering such a large area (Kapidani *et al.*, 2020; Plink *et al.*, 2021). Maritime transport is seen as the most important transport system of international trade. Industrialization, globalization, the increase in the world population, and the depletion of local resources cause the need for maritime transportation to increase day by day (Christiansen *et al.*, 2007). The increase in the importance of maritime transport with each passing day causes an increase in the need for problems and solution proposals in this field. In this context, the number of scientific studies on the problems and innovative ideas in the field of maritime transport is increasing (Bai *et al.*, 2021). Since maritime science is a multidisciplinary field, it is influenced by many mainstream scientific trends (Woo *et al.*, 2011). When the articles written in the field of maritime management are examined, it is seen that studies on ports and waterways are dominant. Although qualitative methods are used to identify problems in such studies, quantitative research methods are often applied

to produce some economic solutions (Shi and Li, 2017). The contribution of scientific studies to the developments in the field of maritime cannot be ignored. It is known that there are many economic, political, and managerial changes in the maritime field together with scientific approaches. (T. E. Notteboom *et al.*, 2013).

When scientific publications related to maritime in the field of social sciences are examined, the most cited studies are effectiveness of operations (Carvalho and Marques, 2012; Chen *et al.*, 2018; Siqueira *et al.*, 2017; Verhoeven, 2010), policies (Eide *et al.*, 2011; Verhoeven, 2010), sustainability (Acciaro *et al.*, 2014; Zis *et al.*, 2014), liner shipping networks (Álvarez, 2009; Ducruet *et al.*, 2010), logistic hubs (Pettit and Beresford, 2009), marine accident analyzes (Uğurlu *et al.*, 2015), port supply chain (Rodrigue and Notteboom, 2009), technological developments (Gharehgozli *et al.*, 2016) and belt and road initiative (BRI) (Lee *et al.*, 2018). When these studies are examined, it is observed that the first articles written about certain trending topics are accepted as pioneering by the articles that will come after them. After the year the articles were first published, many scientific publications are made regarding the solution of the identified problem, and the keywords of these most cited articles are frequently encountered in the studies. In the

journals indexed within the scope of the Web of Science (WoS), there are few journals in the field of social sciences, especially focused on the field of maritime management. The number of articles published in these journals, which are few in number, is increasing day by day. In this case, it shows that the interest of the scientific community regarding the problems in the maritime field is increasing. When the contents of the studies are examined, the maritime industry has new research trends according to the developments in the world. A problem that arises anywhere in the world has a counterpart in the maritime industry. Industry stakeholders, who can adapt to the new situation in the face of wars (Kormych and Averochkina, 2022; Rožić *et al.*, 2022), epidemics (Guerrero *et al.*, 2022; Narasimha *et al.*, 2021; T. Notteboom *et al.*, 2021; Oyenuga, 2021), international relations and technological developments, establish a competitive advantage over their competitors. For this reason, it is known that the stakeholders operating in the maritime sector are in close contact with the scientific community regarding the problems they experience and follow all developments. When the results of the study are examined, it is seen that the trending topics in the world agenda are in the field of interest of scientific research on maritime management. This research aims to determine the main trend

in the articles published between 2011-2022 in the journals published in the field of maritime management and indexed in SSCI. The questions of the study created in this context:

- What are the main topics of maritime transport in the field of social sciences?
- Does the popularity of the studies change over time?
- Is the maritime industry affected by the negativities in the world, and is the scientific community seeking answers to these problems?

2. INPUTS

2.1. Maritime Policy & Management (MPM)

Journal of MPM is an international and multidisciplinary journal. The journal published its first issue in 1973. It has been indexed since 2009 within the scope of WoS. 767 articles were published in the journal between the years 2011-2022, which were covered within the scope of the research. The main topics of the publications according to the WoS categories are shown in Figure 1.

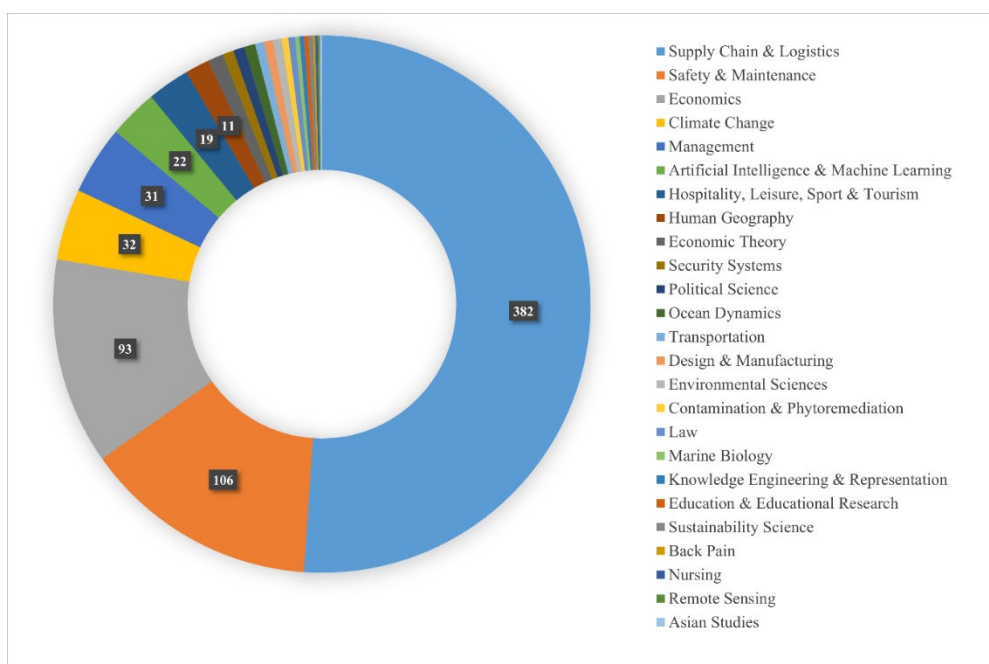


Figure 1. Subject Categories of Articles Published by MPM between 2011-2022 (Source: Authors)

Considering the publication topics of the journal, most articles were published on “Supply Chain & Logistics”. Later, articles were published on the main topics of Safety & Maintenance, Economics, Climate Change, and Management, respectively. According to the categories of article topics, the journal is in the category of social science journals publishing in the field of maritime.

2.2. Maritime Economics & Logistics (MEL)

MEL is a multidisciplinary journal in which international, peer-reviewed scientific articles are published. The journal was first published in 1999. It has been indexed in the WOS database since 2009. Within the scope of this research, all 280 articles published in the journal between 2011-2022 were included in the research. The main topics of the publications according to the WoS categories are shown in Figure 2.

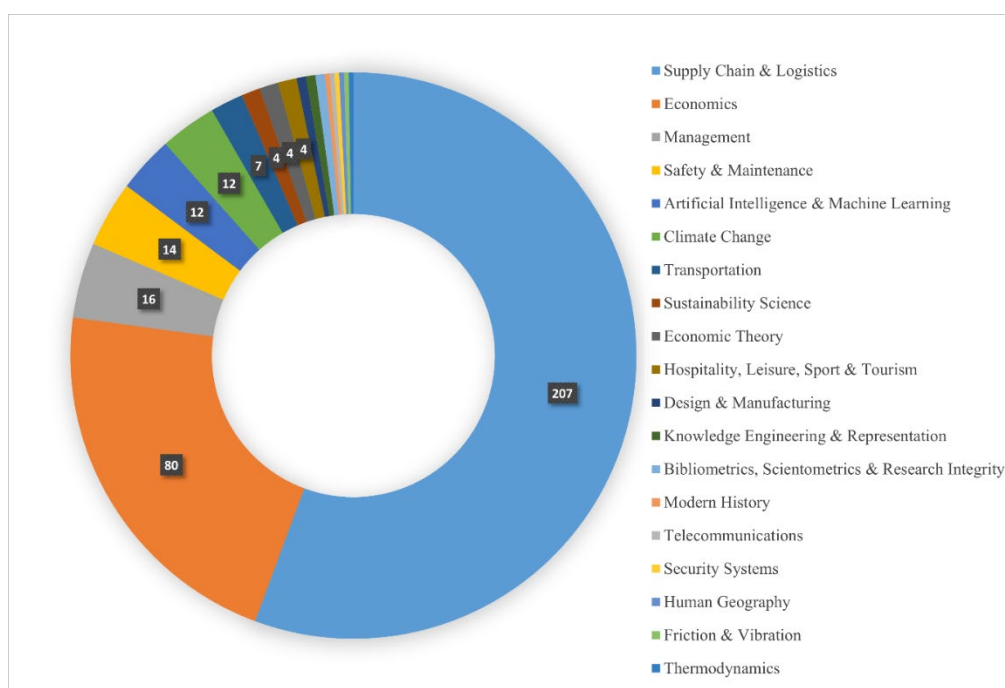


Figure 2. Subject Categories of Articles Published by MEL between 2011-2022 (Source: Authors)

When Figure 2 is examined, most of the articles published in the journal were published in the main subject category of "Supply Chain & Logistics". After this category, “Economics”, “Management”, Safety & Maintenance” main subject categories come respectively. When the main subject categories of the study are examined, it is understood that MEL is a journal that publishes in the field of social sciences and maritime.

2.3. International Journal of Shipping and Transport Logistics (IJSTL)

IJSTL is an international, peer-reviewed, and multidisciplinary scientific journal published in the field of maritime. The journal's first issue was published in 2009 and has been indexed in the WoS database since 2009. Within the scope of the research, 381 articles published between 2011-2022 were examined. The main topics of the publications according to the WoS categories are shown in Figure 3.

When Figure 3 is examined, the category with the most publications in IJSTL is Supply Chain

& Logistics. After this category, articles were published in the “Management”, “Economics” and Safety & Maintenance” categories,

respectively. When the journal topics are examined, IJSTL is a scientific maritime journal that publishes under social sciences.

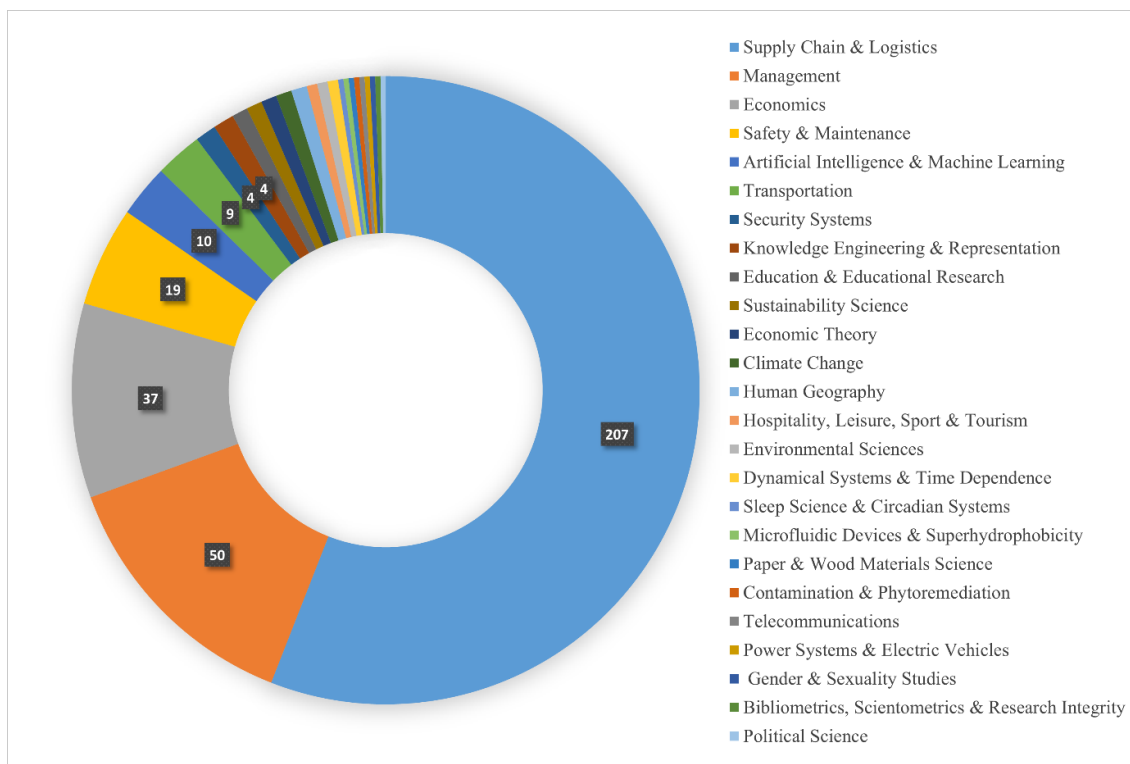


Figure 3. Subject Categories of Articles Published by IJSTL between 2011-2022 (Source: Authors)

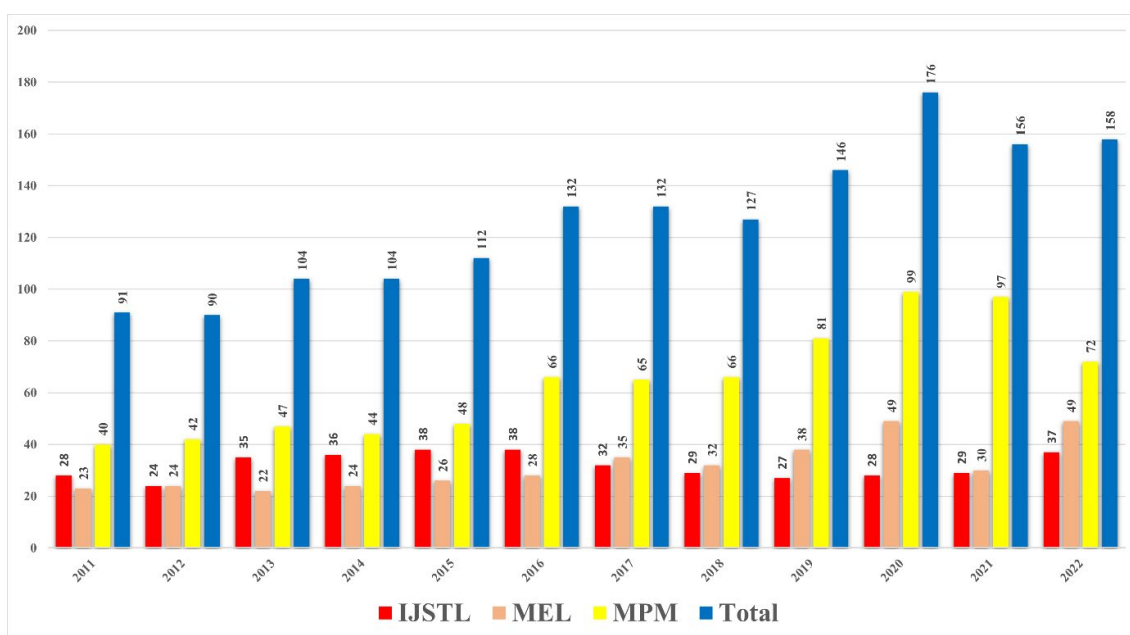


Figure 4. Distribution of the Number of Articles Published in Journals by Years (Source: Authors)

It is seen that there is an increase in the number of articles by years in the Maritime Policy & Management (MPM), Maritime Economics & Logistics (MEL), and International Journal of Shipping and Transport Logistics (IJSTL) examined within the scope of the study. Figure 4 shows the number of articles published by the journals by year. The increase in the number of scientific publications over the years shows that the scientific community is now more interested in the problems experienced in the maritime industry. When the number of articles published by years is examined, MPM increased the number of publications by 80%, MEL by 113%, and IJSTL by 32%. In total, the publication rate in SSCI journals publishing in the field of maritime increased by 73%.

3. MATERIAL AND METHODS

Keywords could be considered as the main indicators that signalize a study's subject area (Evans *et al.*, 2013). Therefore, keyword analysis is a preferred method to analyze and interpret existing literature and to expose focal points in a field. This method has been used in various fields (Onwuegbuzie *et al.*, 2015). Kevork and Vrechopoulos (2009), reviewed 396 relevant articles to the customer relationship management literature in 135 journals and exposed a view of keyword frequency in different categories. Nel *et al.* (2011) took the same path to evaluate the keyword frequency of 417 articles published in a single journal in a selected period.

In line with the aim of the study, a two-step process was followed. As the first step, to reveal the keyword trends in maritime studies, keyword analysis has been conducted. In this study, a journal search was performed on the Web of Science database. The search was limited to the SSCI journals covering 'maritime' or 'shipping' statements in their names. During the journal determination phase, a search was also carried out using the statement 'marine', but since the published journals were related to marine biology and marine resources, those journals in that category were excluded from the research. As the result of this search, 3 journals (International Journal of Shipping and Transport

Logistics, Maritime Economics & Logistics, and Maritime Policy & Management) were included in this study.

The articles in these journals were examined in 3 separate periods. There were 389 papers published in the years 2011 to 2014 containing 879 keywords, 503 in 2015 to 2018 containing 1742 keywords, and 636 in 2019 to 2022 containing 2428 keywords. After a depth examination of keywords in each period, the singular or plural form, or noun or verb form of the same keywords, and abbreviated keywords were combined. It was not preferred to perform semantic coding or categorization to reflect the actual form of used keywords. The keywords used less than 3 for each period were ignored. The interpretations for study trends were made by considering the most frequently mentioned 30 keywords for each period.

At the second stage, it was intended to present a network of keywords for each period. The network of selected keywords was exposed by the VosViewer Software and analysed. The results of the keyword analysis and network analysis were given in the below section.

4. RESULTS AND DISCUSSION

4.1. Keyword Analysis

To draw attention to the most used keywords, the top 30 keywords (a total of 58 different keywords in both periods) that emerged after the necessary combinations were made and ranked according to the frequency of use (see Table 1). In the first period (2011-2014), due to the number of total published papers and their keywords being relatively low, the frequency of mentioned keywords is low, in parallel. In this period, as a research method, the 'data envelopment analysis (DEA)' (n=15) keyword is the most frequent one. Another method-based keyword 'analytical hierarchy process (AHP)' is also listed (n=5). With this, keywords focusing on the shipping concept (shipping; n=14, liner shipping; n=13, container shipping; n=10, short sea shipping; n=6, and dry bulk shipping; n=4) form the top of the list. Besides, keywords in the scope of port (port(s); n=11, port competition; n=3, and port security; n=3) stand out. Additionally, 'container terminal(s)' (n=9) and

'efficiency' (n=8) are also very frequent.

Due to piracy and armed robbery, security concerns have been raised in the first decade of the 21st century. Its reflection can be seen in the first period of the table as the keywords like; 'supply chain security', 'port security', and 'transport security'. Except this, the competitive approach was also showing itself by 'competition', 'service quality', and 'port competition'.

The most frequent keyword in the second period (2015-2018) is 'port(s) (n=24)'. Other keywords related to the port concept (port performance; n=7, port pricing; n=6, and port competition; n=6) are also listed. It is seen that the method-based keywords data envelopment analysis (dea) (n=21), and analytical hierarchy process (ahp) (n=14) are frequently mentioned. Besides, container-based keywords (container terminal(s); n=15, container(s); n=12, and container shipping; n=10) are also frequent. Additionally, shipping-based keywords (liner shipping; n=19, short sea shipping; n=14, and shipping; n=11) are visible in the upper half of the table.

The competitive approach is more visible in the studies of the second period. 'customer satisfaction' and 'competitiveness' keywords can be also counted in this context. Although efficiency is in the previous period, when evaluated together with the keywords 'freight rate' and 'port pricing', it indicates that economic concerns have risen in this period.

In the third period (2019-2022), the 'maritime transportation' is the most frequent one (n=27). Many keywords within the scope of shipping are listed (container shipping; n=20, shipping; n=18, liner shipping; n=15, autonomous shipping (ships); n=8, and maritime shipping; n=7). The keywords 'port(s)' (n=26) and 'seaport(s)' (n=11) are also frequent. It is seen that some new keywords emphasizing global warming and sustainability concerns (port efficiency; n=12, sustainability/sustainable development; n=11, climate change; n=9, autonomous shipping (ships); n=8) are at the top of the list. This points out that the concerns in this scope were increased.

In this period, the reflections of the worldwide pandemic crisis can be seen in the studies by the

keyword 'covid-19' (n=10). Besides, China's 'Belt and road initiative (bri)' become a new and frequently mentioned keyword. The 'efficiency' transformed to 'port efficiency' in this period.

Table 2 demonstrates the trend of the top 30 keywords over 12 years. Some of the keywords (belt and road initiative (bri), hinterland, container(s), seaport(s), literature review, maritime logistics, port efficiency, sustainability / sustainable transportation, and automatic identification system (ais)) do not exist in the first period. The keywords 'transport logistics' and 'service quality' are not seen in the third period. However, the 'port efficiency', 'covid-19', 'maritime safety', and 'climate change' keywords exist only in the third period. 'port(s)', and 'maritime transport(ation)' is the most used keywords, and they are in increasing trend. Although the shipping-based keywords (liner shipping, shipping, container shipping, and short sea shipping) are the most given keywords, they are in a decreasing trend in the last period except 'container shipping'. Method-based keywords (data envelopment analysis (dea), and analytical hierarchy process (ahp)) made a peak in the second period and entered a downtrend. 'belt and road initiative (bri)', 'automatic identifications system (ais)', 'seaport(s)', 'port efficiency sustainability / sustainable development' are the keywords that are in the most uptrend. 'Covid-19', 'maritime safety', and 'climate change', which were not mentioned in the previous period, showed high frequency in the last period.

Table 1. Keyword frequencies

No.	2011-2014 Keywords	f	2015-2018 Keywords	f	2019-2022 Keywords	f
1	data envelopment analysis (dea)	15	port(s)	24	maritime transport(action)	27
2	shipping	14	data envelopment analysis (dea)	21	port(s)	26
3	liner shipping	13	liner shipping	19	container terminal(s)	21
4	port(s)	11	container terminal(s)	15	container shipping	20
5	container shipping	10	analytical hierarchy process (ahp)	14	shipping	18
6	transport logistics	9	maritime transport / transportation	14	belt and road initiative (bri)	16
7	container terminal(s)	9	short sea shipping	14	liner shipping	15
8	maritime transport(ation)	9	container (s)	12	china	14
9	efficiency	8	logistics	12	port efficiency	12
10	supply chain security	6	china	11	Seaport(s)	11
11	supply chain	6	shipping	11	sustainability / sustainable development	11
12	short sea shipping	6	container shipping	10	covid-19	10
13	china	5	competition	8	maritime safety	10
14	analytical hierarchy process (ahp)	5	freight rate	7	automatic identification system (ais)	9
15	service quality	4	service quality	7	climate change	9
16	logistics	4	literature review	7	data envelopment analysis (dea)	9
17	finland	4	port performance	7	hinterland	9
18	optimization	4	structural equation modelling	7	risk assessment	9
19	simulation	4	efficiency	6	autonomous shipping (ships)	8
20	dry bulk shipping	4	dry bulk	6	container port(s)	8
21	confirmatory factor analysis	3	customer satisfaction	6	genetic algorithm	8
22	fuzzy logic	3	maritime logistics	6	literature review	7
23	regulation	3	northern sea route	6	maritime logistics	7
24	competition	3	port pricing	6	maritime shipping	7
25	risk management	3	port competition	6	regulation	6
26	usa	3	hinterland	6	cluster analysis	6
27	port competition	3	genetic algorithm	6	containers	6
28	port security	3	maritime	6	supply chain	6
29	transport	3	transport logistics	5	competition	6
30	transport security	3	competitiveness	5	port operations	6

Source: Authors

Considering the trend according to the periods, the number of studies and keywords gradually increased over periods. The average frequency of most keywords is also increasing. It is seen that the most mentioned keywords are almost the same except for minor ranking changes. The major topics of maritime studies are focusing on ports, maritime transportation, or shipping issues. While ‘port(s)’, and ‘maritime transport(ation)’ are increasing, shipping-based keywords are in a decreasing trend, in general. For all that, some sustainability-concerned

keywords put forward in the third period. ‘sustainability/sustainable development’, ‘port efficiency’, and ‘climate change’ shows the maritime studies’ interest in both the dimensions of sustainability, especially in economic and environmental. Additionally, the most increased keyword ‘belt and road initiative (bri)’ became a very popular topic in the last period. It is predicted that these keywords, which have increased rapidly in the last period, will be used more frequently in reviewed studies.

Table 2. Keyword trends by periods

	Keywords	f (2011-2014)	f (2015-2018)	Change %	f (2019-2022)	Change %	Total
1	port(s)	11	24	118	26	8	61
2	maritime transport(ation)	9	14	56	27	93	50
3	liner shipping	13	19	46	15	-21	47
4	container terminal(s)	9	15	67	21	40	45
5	data envelopment analysis (dea)	15	21	40	9	-57	45
6	shipping	14	11	-21	18	64	43
7	container shipping	10	10	0	20	100	40
8	china	5	11	120	14	27	30
9	short sea shipping	6	14	133	5	-64	25
10	analytical hierarchy process (ahp)	5	14	180	5	-64	24
11	logistics	4	12	200	5	-58	21
12	belt and road initiative (bri)	-	4	100	16	300	20
13	hinterland	-	6	100	9	50	19
14	container(s)	-	12	100	6	-50	18
15	competition	3	8	167	6	-25	17
16	efficiency	8	6	-25	3	-50	17
17	genetic algorithm	3	6	100	8	33	17
18	port efficiency	-	5	100	12	140	17
19	supply chain	6	4	-33	6	50	16
20	sustainability / sustainable development	-	5	100	11	120	16
21	seaport(s)	-	4	100	11	175	15
22	literature review	-	7	100	7	0	14
23	transport logistics	9	5	-44	-	-100	14
24	maritime logistics	-	6	100	7	17	13
25	automatic identification system (ais)	-	3	100	9	200	12
26	port competition	3	6	100	3	-50	12
27	service quality	4	7	75	-	-100	11
28	covid-19	-	-	-	10	100	10
29	maritime safety	-	-	-	10	100	10
30	climate change	-	-	-	9	100	9

Source: Authors

4.2. Keyword Network Analysis

The keyword analysis performed via VosViewer is given below. Figure 5, 6, and 7 demonstrates the keyword networks in periods. The size of any node represents the keyword frequency. The colors indicate the keywords clusters.

According to Figure 5, the strongest keywords in terms of total link strength are ‘port(s)’, ‘shipping’, ‘transport logistics’, and ‘data

envelopment analysis (dea)’, respectively. While ‘port(s)’ are mostly linked to ‘shipping’, ‘supply chain’, ‘service quality’, and ‘regulation’; ‘shipping’ is used with ‘transport logistics’, ‘maritime transport(ation)’, ‘service quality’, and ‘china’. The strongest link in this period is between ‘supply chain security’ and ‘transport security’.

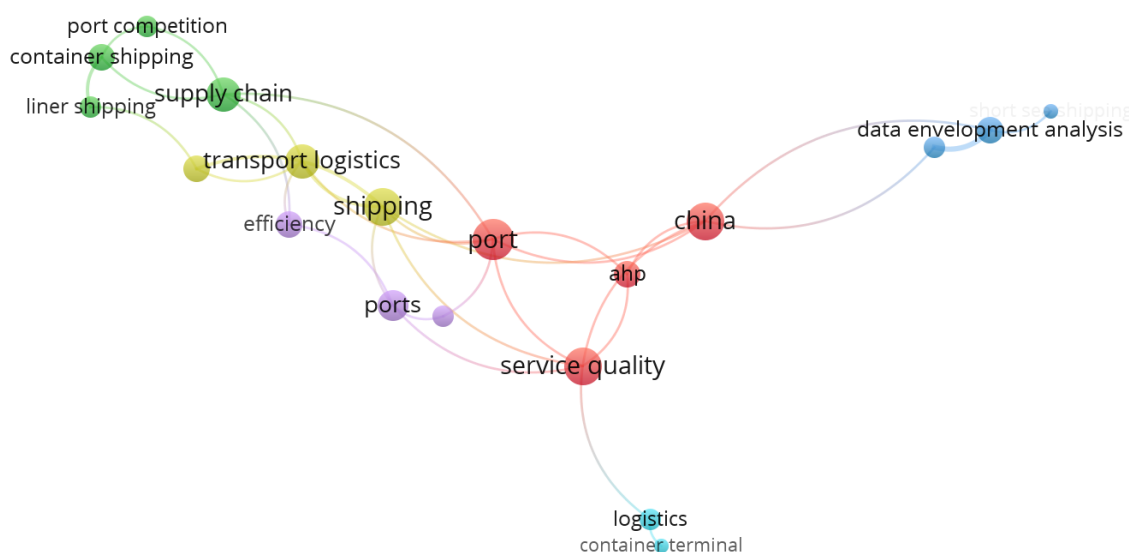


Figure 5. Network analysis of keywords co-occurrence in 2011-2014 (Source: Authors)

The strongest keywords in terms of total link strength in the 2015-2018 period are (Figure 6); ‘data envelopment analysis (dea)’, ‘liner shipping’, ‘port(s)’, and ‘short sea shipping’, respectively. The studies including ‘data envelopment analysis (dea)’ generally include ‘container(s)’, ‘container shipping’, ‘liner shipping’, and ‘port(s)’. ‘liner shipping’ has a strong link with ‘service quality’, and ‘logistics’. ‘port(s)’ and ‘logistics’ are used together. The strongest network in this period is between ‘liner shipping’ and ‘logistics’.

In the last period (2019-2022), the strongest keywords in terms of total link strength are

(Figure 7); ‘maritime transport(ation)’, ‘shipping’, ‘climate change’, and ‘port(s)’ respectively. ‘shipping’ has a strong network to ‘regulation’, ‘port(s)’, ‘seaport(s)’. ‘climate change’ is also linked to same keywords. One of the new keywords ‘belt and road initiative (bri)’ is used together with ‘port efficiency’, ‘seaport(s)’, and ‘china’. ‘sustainability/sustainable development’ is generally related to the shipping-based keywords. The ‘covid-19 links show that there are studies on the pandemic linked to various topics.

multidisciplinary methods. The methods used in different fields in pioneering studies in the field of maritime business management are rapidly becoming popular and are used in much research. In the following period, overused methods enter a downward trend, and new methods are seen to be used. It is seen that the main themes of port and logistics are used throughout the studies. It has been determined that especially in the studies related to the main theme of the port, container transportation and liner transportation are emphasized.

Within the scope of the research, three journals that are purely maritime management journals were selected and analyzes were made for the articles published in these journals. In future studies, the study can be expanded by adding articles about maritime in journals whose main themes are transportation, logistics, etc.

AUTHORSHIP STATEMENT

Erdem KAN: Conceptualization, Methodology, Validation, Resources, Writing - Original Draft, Writing-Review and Editing, Data Curation, Visualization.

Özgür TEZCAN: Conceptualization, Methodology, Validation, Formal Analysis, Resources, Writing - Original Draft, Writing-Review and Editing, Data Curation, Software, Visualization.

CONFLICT OF INTERESTS

The authors declare that for this article they have no actual, potential, or perceived conflict of interest.

ETHICS COMMITTEE PERMISSION

No ethics committee permissions are required for this study

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ORCID IDs

Erdem KAN:

 <https://orcid.org/0000-0002-9834-5749>

Özgür TEZCAN:

 <https://orcid.org/0000-0001-6222-4665>

6. REFERENCES

- Acciaro, M., Vanelander, T., Sys, C., Ferrari, C., Rouboutsos, A., Giuliano, G., Lam, J.S.L., Kapros, S., (2014). Environmental sustainability in seaports: A framework for successful innovation. *Maritime Policy & Management* 41(5): 480–500. doi:10.1080/03088839.2014.932926.
- Álvarez, J.F., (2009). Joint Routing and Deployment of a Fleet of Container Vessels. *Maritime Economics & Logistics* 11(2): 186–208. doi:10.1057/mel.2009.5.
- Bai, X., Zhang, X., Li, K.X., Zhou, Y., Yuen, K.F., (2021). Research topics and trends in the maritime transport: A structural topic model. *Transport Policy* 102: 11–24. doi:10.1016/j.tranpol.2020.12.013.
- Carvalho, P., Marques, R.C., (2012). Using non-parametric technologies to estimate returns to scale in the Iberian and international seaports. *International Journal of Shipping and Transport Logistics* 4(3): 286–302.
- Chen, H.K., Chou, H.W., Hsieh, C.C., (2018). Operational and disaggregate input efficiencies of international container ports: An application of stochastic frontier analysis. *International Journal of Shipping and Transport Logistics* 10(2): 113–159.
- Christiansen, M., Fagerholt, K., Nygreen, B., Ronen, D., (2007). Chapter 4 Maritime Transportation. In *Handbooks in Operations Research and Management Science* Vol. 14, pp. 189–284. Elsevier. doi:10.1016/S0927-0507(06)14004-9.
- Ducruet, C., Lee, S.W., Ng, A.K.Y., (2010). Centrality and vulnerability in liner shipping networks: Revisiting the Northeast Asian port hierarchy. *Maritime Policy & Management* 37(1): 17–36. doi:10.1080/03088830903461175.
- Eide, M.S., Longva, T., Hoffmann, P., Endresen, Ø., Dalsøren, S.B., (2011). Future cost scenarios for reduction of ship CO₂ emissions. *Maritime Policy & Management* 38(1): 11–37. doi:10.1080/03088839.2010.533711.
- Evans, J.R., Foster, S.T., Guo, Z., (2013). A Retrospective View of Research in the Quality Management Journal: A Thematic and Keyword Analysis. *Quality Management Journal* 20(1): 37–47. doi:10.1080/10686967.2013.11918090.

- Gharehgozli, A.H., Roy, D., De Koster, R., (2016).** Sea container terminals: New technologies and OR models. *Maritime Economics & Logistics* 18(2): 103–140. doi:10.1057/mel.2015.3.
- Guerrero, D., Letrouit, L., Pais-Montes, C., (2022).** The container transport system during Covid-19: An analysis through the prism of complex networks. *Transport Policy* 115: 113–125. doi:10.1016/j.tranpol.2021.10.021.
- Kapidani, N., Bauk, S., Davidson, I.E., (2020).** Digitalization in Developing Maritime Business Environments towards Ensuring Sustainability. *Sustainability* 12(21): 9235. doi:10.3390/su12219235.
- Kevork, E.K., Vrechopoulos, A.P., (2009).** CRM literature: Conceptual and functional insights by keyword analysis. *Marketing Intelligence & Planning* 27(1): 48–85. doi:10.1108/02634500910928362.
- Kormych, B., Averochkina, T., (2022).** Ukrainian Maritime Industry under Fire: Consequences of Russian Invasion. *Lex Portus* 8: 7.
- Lee, P.T.W., Hu, Z.H., Lee, S.J., Choi, K.S., Shin, S.H., (2018).** Research trends and agenda on the Belt and Road (B&R) initiative with a focus on maritime transport. *Maritime Policy & Management* 45(3): 282–300. doi:10.1080/03088839.2017.1400189.
- Narasimha, P.T., Jena, P.R., Majhi, R., (2021).** Impact of COVID-19 on the Indian seaport transportation and maritime supply chain. *Transport Policy* 110: 191–203. doi:10.1016/j.tranpol.2021.05.011.
- Nel, D., Van Heerden, G., Chan, A., Ghazisaeedi, M., Halvorson, W., Steyn, P., (2011).** Eleven years of scholarly research in the Journal of Services Marketing. *Journal of Services Marketing* 25(1):, 4–13. doi:10.1108/08876041111107014.
- Notteboom, T.E., Pallis, A.A., De Langen, P.W., Papachristou, A., (2013).** Advances in port studies: The contribution of 40 years Maritime Policy & Management. *Maritime Policy & Management* 40(7): 636–653. doi:10.1080/03088839.2013.851455.
- Notteboom, T., Pallis, T., Rodrigue, J.P., (2021).** Disruptions and resilience in global container shipping and ports: The COVID-19 pandemic versus the 2008–2009 financial crisis. *Maritime Economics & Logistics* 23(2): 179–210. doi:10.1057/s41278-020-00180-5.
- Onwuegbuzie, A., Leech, N., Collins, K., (2015).** Qualitative Analysis Techniques for the Review of the Literature. The Qualitative Report. doi:10.46743/2160-3715/2012.1754.
- Oyenuga, A., (2021).** Perspectives on the impact of the COVID-19 pandemic on the global and African maritime transport sectors, and the potential implications for Africa's maritime governance. *WMU Journal of Maritime Affairs* 20(2): 215–245. doi:10.1007/s13437-021-00233-3.
- Pettit, S.J., Beresford, A.K.C., (2009).** Port development: From gateways to logistics hubs. *Maritime Policy & Management* 36(3): 253–267. doi:10.1080/03088830902861144.
- Plink, N., Semeoshenkova, V., Eremina, T., Ershova, A., Mushket, I., (2021).** Improvement of Maritime Management as a Key Aspect of Sustainable Development and Blue Growth in the Russian Federation. *Journal of Marine Science and Engineering* 9(11): 1212. doi:10.3390/jmse9111212.
- Rodrigue, J.P., Notteboom, T., (2009).** The terminalization of supply chains: Reassessing the role of terminals in port/hinterland logistical relationships. *Maritime Policy & Management* 36(2): 165–183. doi:10.1080/03088830902861086.
- Rožić, T., Naletina, D., Zajac, M., (2022).** Volatile Freight Rates in Maritime Container Industry in Times of Crises. *Applied Sciences* 12(17): 8452. doi:10.3390/app12178452.
- Shi, W., Li, K.X., (2017).** Themes and tools of maritime transport research during 2000-2014. *Maritime Policy & Management* 44(2): 151–169. doi:10.1080/03088839.2016.1274833.
- Siqueira, G.A., Jr, I.C.L., Cunha, L.C.D., Guimarães, V.D.A., Guabiroba, R.C.D.S., (2017).** Analysis of technical efficiency and eco-efficiency in container terminals. *International Journal of Shipping and Transport Logistics* 9(5): 562–579.
- Uğurlu, Ö., Köse, E., Yıldırım, U., Yüksekıldız, E., (2015).** Marine accident analysis for collision and grounding in oil tanker using FTA method. *Maritime Policy & Management* 42(2): 163–185. doi:10.1080/03088839.2013.856524.
- Verhoeven, P., (2010).** A review of port authority functions: Towards a renaissance? *Maritime Policy & Management* 37(3): 247–270. doi:10.1080/03088831003700645.
- Wang, P., Mileski, J., (2018).** Strategic maritime management as a new emerging field in maritime studies. *Maritime Business Review* 3(3): 290–313. doi:10.1108/MABR-06-2018-0019.
- Woo, S.H., Pettit, S.J., Kwak, D.W., Beresford, A.K.C., (2011).** Seaport research: A structured literature review on methodological issues since the 1980s. *Transportation Research Part A: Policy and Practice* 45(7): 667–685. doi:10.1016/j.tra.2011.04.014.
- Zis, T., North, R.J., Angeloudis, P., Ochieng, W.Y., Harrison Bell, M.G., (2014).** Evaluation of cold ironing and speed reduction policies to reduce ship emissions near and at ports. *Maritime Economics & Logistics* 16(4): 371–398. doi:10.1057/mel.2014.6.