CUSTOMS IN MARITIME SECURITY: A SYSTEMATIC LITERATURE REVIEW WITH A BIBLIOMETRIC APPROACH USING THE SCOPUS DATABASE

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Abstract
Maritime security faces increasingly complex threats, while customs plays a strategic role in border surveillance, the flow of goods, and supply chain security. This study aims to map the development and interrelationships of research themes on customs within maritime security from 2015–2025. The study uses a Systematic Literature Review (SLR) approach and bibliometric analysis of Scopus-indexed journal articles, visualized using VOSviewer. The selection process yielded 19 relevant articles. The analysis shows that research has developed fluctuatingly, with a tendency toward increased publication since 2020. Keyword mapping identifies five main clusters: cybersecurity and paperless cross-border trade, border surveillance, maritime policy and economic growth, organized crime, and maritime domain awareness. International trade and economic growth serve as connectors between clusters, while recent developments show a shift in focus toward authentication, network security, and cross-border issues. These findings indicate that the study of customs and maritime security is multidimensional yet still fragmented, highlighting the need for integrated research across cybersecurity, border surveillance, trade, and maritime governance.

Keywords: *customs, maritime security, systematic literature review, bibliometric analysis*

Introduction

Maritime security has become a strategic global issue as cross-border threats grow increasingly complex, ranging from smuggling and illicit trade to organized crime in maritime areas. In this context, customs occupies a strategic position as the frontline institution responsible for controlling the movement of goods, vessels, and people crossing ports and maritime borders. Its role therefore extends beyond trade facilitation to include a contribution to the security architecture of a state. Arifin et al. (2024) argue that maritime border formalities, including customs and immigration, need to be reconstructed to reconcile trade facilitation with enhanced security, as reflected in immigration clearance practices in Indonesia. This complexity is further compounded by governance and sovereignty issues inherent in maritime spaces, given

that each state has distinct jurisdictions and interests in monitoring its maritime territory (Dayan & Rubin, 2026).

At the same time, the digitalization of supply chains and customs systems has introduced new dimensions of threat through cyber vulnerabilities, requiring stronger security governance across maritime infrastructure. Bolbot et al. (2022), through a systematic literature review (SLR) and bibliometric analysis, demonstrate that maritime cybersecurity research has developed rapidly but remains dispersed across various sub-themes that have yet to be fully integrated. A similar condition may exist in research on customs and maritime security, as the topic intersects with international law, trade economics, and cybersecurity, causing the available literature to remain fragmented and insufficiently mapped in a comprehensive manner.

To date, no study has been identified that specifically maps the development, trends, and intellectual structure of research on customs in maritime security through a bibliometric approach based on Scopus data. Such mapping is important for identifying research directions, knowledge gaps, and relationships among themes that have not yet been systematically revealed. A systematic literature review (SLR) approach was selected because it can minimize bias through structured search, selection, and evaluation protocols (Chakraborty & Kar, 2024; García-Peñalvo, 2022; Thomé et al., 2016), as has also been applied in other security domains, including security in software development processes (Arega et al., 2024). The rigor of SLR protocols is critical to the quality of review findings; therefore, clear and validated methodological guidance is required (Azarian et al., 2023; Carrera-Rivera et al., 2022; Schweizer & Nair, 2017). Mempertegas

The literature gap is not merely the absence of studies discussing customs and maritime security, but the absence of an integrated map that explains how these two domains have developed and become intellectually connected across the literature. Existing studies identified in the reviewed corpus tend to examine specific dimensions of the customs–maritime security nexus, including container screening, counterterrorism, supply chain security, port policing, border control, maritime law enforcement, and cybersecurity. However, these contributions remain distributed across different disciplinary and geographical contexts, making it difficult to determine whether they constitute a coherent research field, which themes have become dominant, and how established themes are connected to emerging security concerns. Consequently, the existing literature provides substantial substantive knowledge but limited meta-level understanding of the structure and evolution of the field. This study addresses this gap by combining a Systematic Literature Review with bibliometric analysis to move beyond an article-by-article description and identify publication development, keyword relationships, thematic clusters, and temporal shifts within research on customs in maritime security. The novelty therefore lies in providing a systematic and bibliometrically grounded research map specifically focused on the customs–maritime security nexus, rather than examining maritime security or maritime cybersecurity as broader and more established fields. This distinction is important because customs operates simultaneously as a trade-facilitation institution, a border-control actor, and a security institution, creating an interdisciplinary research space that cannot be adequately understood through a single thematic perspective.

The 2015–2025 period was selected as an eleven-year observation window to provide sufficient temporal depth to identify both the emergence of research themes

and their subsequent development while maintaining relevance to contemporary maritime security challenges. The starting point of 2015 is particularly appropriate for establishing the earliest phase represented in the identified Scopus-indexed literature, while 2025 provides the most recent endpoint of the defined observation period and captures the transition toward contemporary concerns such as digitalization, cybersecurity, paperless cross-border trade, and increasingly interconnected maritime security governance. The period therefore allows the study to examine not only how many studies were published, but also whether the substantive orientation of the field has changed over time. Rather than treating 2015–2025 merely as a convenient publication filter, the period is used analytically to capture the transition from predominantly physical, economic, and border-oriented security concerns toward increasingly digital, networked, and multi-actor forms of maritime security.

To enrich the SLR findings, this study integrates bibliometric analysis using VOSviewer to visualize keyword networks, thematic clusters, and patterns of research development over time (McAllister et al., 2022; van Eck & Waltman, 2010). The combination of SLR and bibliometric analysis enables the identification of research trends quantitatively while also supporting qualitative interpretation of the development of scholarship on customs in maritime security.

Based on the foregoing, this study aims to map the number and trends of Scopus-indexed publications on customs in maritime security during 2015–2025 and to analyze the relationships among research topics through bibliometric visualization. The findings are expected to provide a theoretical contribution in the form of a research roadmap for the future development of customs and maritime security studies, as well as a practical contribution for customs authorities in formulating maritime border-control policies that are more adaptive to contemporary threat dynamics.

Despite the growing recognition of customs as an important component of maritime security, the development of scholarly research on this intersection remains insufficiently understood. Existing studies have addressed diverse aspects of customs-related maritime security, including container screening, counterterrorism, maritime supply-chain security, border control, port policing, maritime law enforcement, and the security of increasingly digitalized trade systems. However, these contributions remain dispersed across different thematic, disciplinary, and geographical contexts, making it difficult to determine how research on customs in maritime security has developed over time and which issues have become increasingly prominent. This fragmentation also limits understanding of the relationships among the topics addressed in the literature, including whether research has remained concentrated on traditional concerns such as trade, border control, and maritime policy or has increasingly expanded toward cybersecurity, organized crime, maritime domain awareness, and other emerging security concerns. Therefore, a systematic examination is needed to establish the development and distribution of scholarly attention within this field, while also identifying the thematic relationships, clusters, and shifts that characterize its intellectual structure. Addressing these issues is essential for clarifying the current state of knowledge on customs in maritime security, identifying patterns in its development, and providing a more coherent basis for future research.

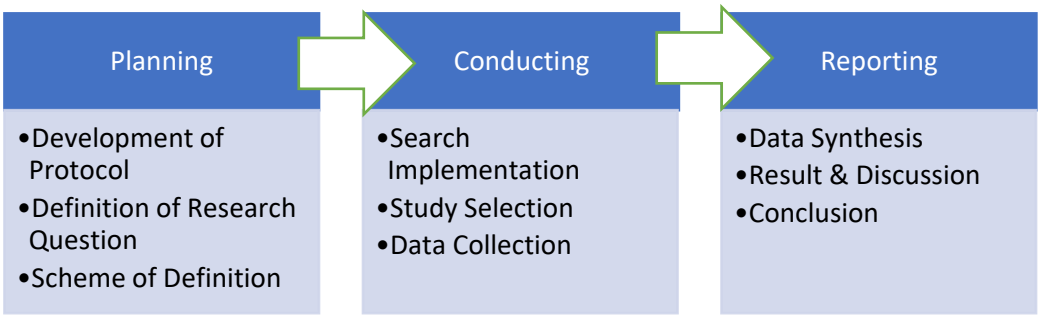
Method

This study employs a quantitative descriptive research design, applying a Systematic Literature Review (SLR) as its primary methodological framework. The identification and mapping of scientific articles were conducted using bibliometric analysis to reveal trends, developmental dynamics, and research orientations related to customs within the context of maritime security. The primary data consisted of journal articles indexed in the Scopus database, covering publications from 2015 to 2025. This time period was selected to provide a comprehensive yet current literature review in accordance with the predetermined search date.

According to Triandini (2019), a Systematic Literature Review (SLR) is a methodological approach designed to collect and assess previous research findings related to a particular research focus. Through this approach, researchers seek to identify, examine, evaluate, and interpret available research evidence within a field of inquiry based on relevant research questions, thereby minimizing potential bias and errors. Journal articles were collected through bibliometric analysis by searching for relevant articles in the Scopus database and processing the results using VOSviewer to illustrate research trends. Bibliometric analysis enables research networks to be visualized, allowing relationships among publications and the development of research trends within the selected journal database to be understood more comprehensively. Accordingly, publication mapping through bibliometric analysis serves to identify the trends, concepts, and keywords required for the study.

The SLR was conducted through three sequential phases: planning, execution, and reporting. During the planning phase, the researchers developed a protocol framework adapted to the research context, identified relevant protocols, reviewed the preliminary literature, and formulated the research questions (RQs). The execution phase focused on implementing the search strategy, including determining search terms, selecting data sources, establishing inclusion and exclusion criteria, assessing the quality of retrieved studies, and extracting data from the search results. Finally, the reporting phase involved presenting the collected data, followed by discussion and conclusions.

Data collection was conducted in two stages. The first stage involved collecting bibliometric data from the Scopus database (https://www.scopus.com/) using keywords formulated according to the SLR inclusion and exclusion criteria. The search results were then exported in CSV format. The second stage involved processing the bibliometric data using VOSviewer by uploading the exported file into the software and adjusting the calculation method according to the requirements of the analysis. VOSviewer subsequently processed the data to generate visualizations of research-trend networks based on keywords, connecting lines, and color-coded clusters.



Picture 1. Systematic Literature Review Stages

Planning: Research Questions

The research questions were formulated using the PICOC (Population, Intervention, Comparison, Outcome, Context) framework to identify the research questions and define the scope of the study.

Table 1. Identification of Research Questions and Study Scope Based on PICOC

Criteria	Scope
Population	Customs or Customs Authorities
Intervention	The study is limited to customs or customs authorities in the context of maritime security or maritime surveillance
Comparison	Not applied
Outcomes	Development of customs within maritime security during 2015–2025
Context	Review of literature findings on trends in customs within maritime security

The research questions are as follows:

RQ1: How many studies addressed customs in maritime security during the 2015–2025 period?

RQ2: What were the trends in the relationships among research topics concerning customs in maritime security during 2015–2025?

Execution: Search Process Strategy

Search Terms

The search strategy was formulated in accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines, using specific search terms and an online database as the data source.

Table 2. Search Terms and Search-Term Structure

Search Terms	
Criterion	Synonym Integration (Search Terms)
Population	Customs OR Customs Authorities
Intervention	Customs or Customs Authorities in Maritime Security or Maritime Surveillance

Search-Term Structure
(Customs in Maritime Security) OR (Customs Authorities in Maritime Security) OR (Customs in Maritime Surveillance) OR (Customs Authorities in Maritime Surveillance)

The search strategy was restricted to studies explicitly containing “customs” or “customs authorities” in combination with “maritime security” or “maritime surveillance” within the title, abstract, or keywords. Consequently, studies using alternative terminology, such as border control, coast guard, port security, or maritime law enforcement, without explicit reference to customs were excluded from the search scope. This restriction was applied to maintain a focused and consistent search scope aligned with the study’s objective of examining customs within the maritime security context.

Literature Sources

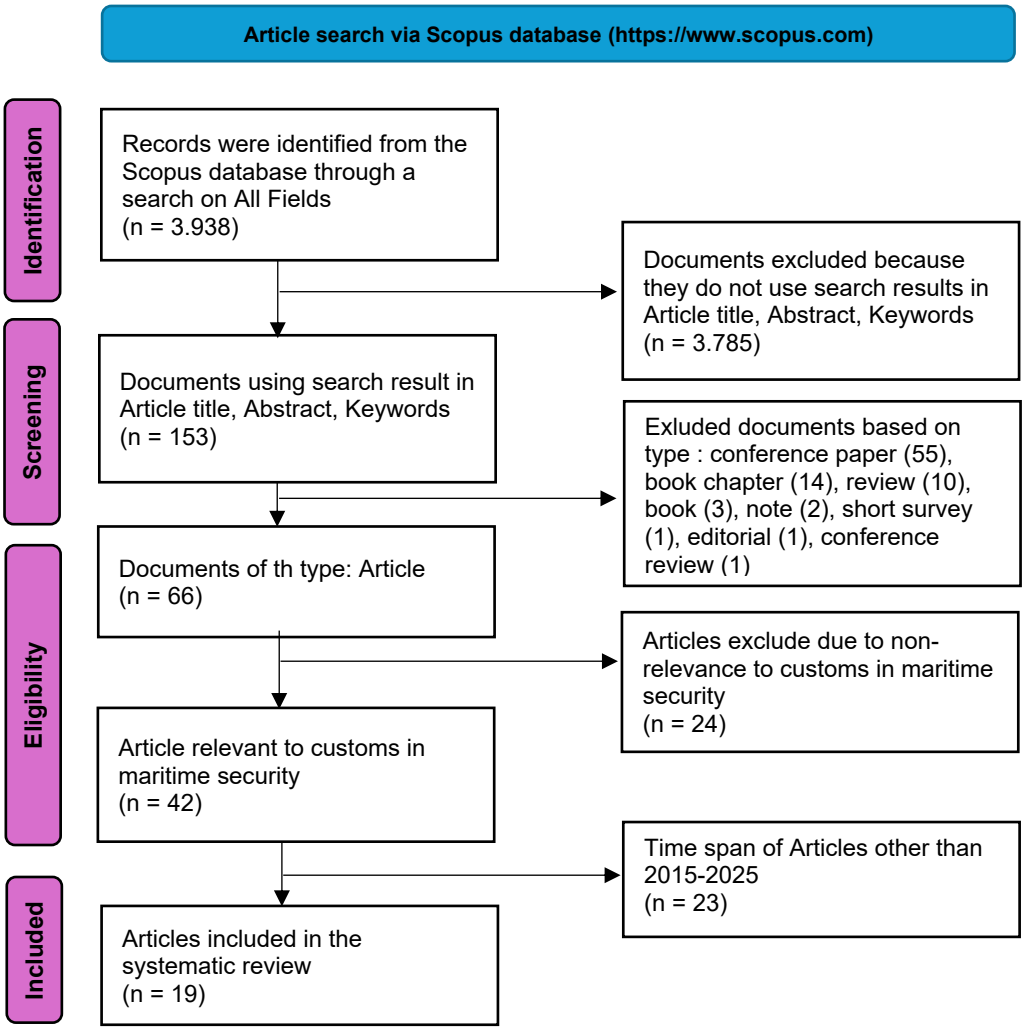
The literature search was conducted using the Scopus database (https://www.scopus.com) and covered publications issued between 2015 and 2025. The search employed a bibliometric-analysis approach to identify relevant research available in the database.

Inclusion and Exclusion Criteria

To ensure that the articles were consistent with the research context, the reviewed journal articles were selected using inclusion and exclusion criteria.

Table 3. Inclusion and Exclusion Criteria

Inclusion	Exclusion
Literature consisting of scientific journal articles reporting research findings indexed in the Scopus database	Literature other than scientific journal articles reporting research findings indexed in the Scopus database
Articles identified through searches of Article Title, Abstract, and Keywords	Articles identified only through an "All Fields" search but not through Article Title, Abstract, and Keywords
Documents classified as Article (journal article)	Documents classified as conference paper, book chapter, review, book, note, short survey, editorial, or conference review
Articles relevant to customs in maritime security	Articles not relevant to customs in maritime security
Publication period of scientific journal articles spanning 2015–2025	Publication period of scientific journal articles spanning other than 2015–2025



Picture 2. Information Flow of the Systematic Literature Review Using PRISMA

Result and Discussion

RQ1: How many studies addressed customs in maritime security during the 2015–2025 period?

The selection process based on the inclusion and exclusion criteria in the Scopus database yielded 19 articles relevant to customs in maritime security during 2015–2025, as presented in Table 4. These articles cover a diverse range of themes, including container screening and surveillance, cross-border customs cooperation, maritime law enforcement, and border governance across regions such as Europe, the United States, South Korea, South Africa, and Indonesia. The publication distribution indicates that academic attention to this issue was relatively fluctuating during the earlier part of the decade but increased noticeably from 2020 to 2025. Qualitatively, the thematic diversity of these studies indicates that customs-related maritime security has developed as an interdisciplinary field spanning supply-chain protection, border governance, maritime law enforcement, and emerging security technologies, rather than as a narrowly defined research domain.

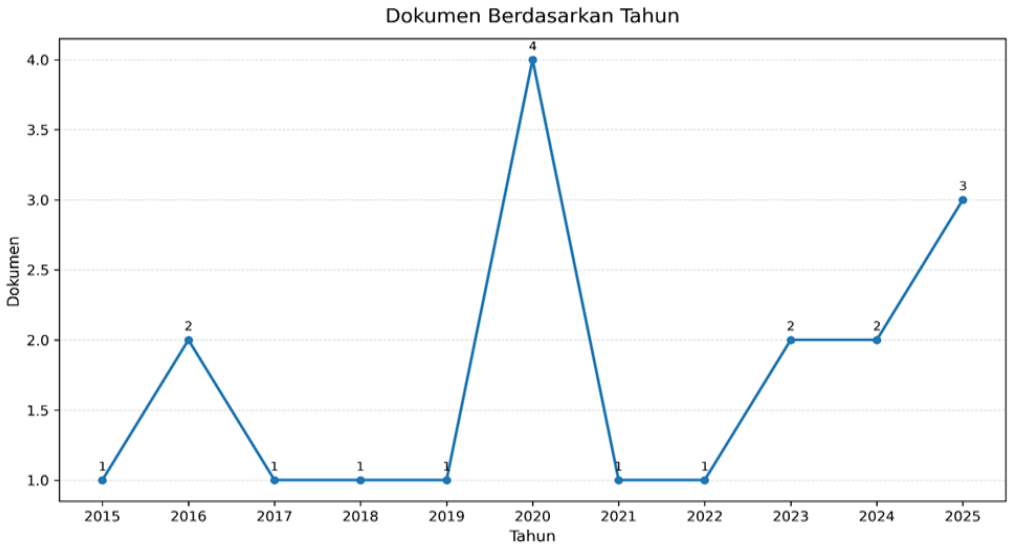
Table 4. Selected Articles on Customs in Maritime Security, 2015–2025

No	Title	(Author, Issued)
1	Analysis of screening checkpoint operations for transatlantic container transportation	(Jizba et al., 2015)
2	The 'best small nation navy in the world'? The twenty-first century Royal New Zealand Navy	(Paget, 2016)
3	Securing the Transatlantic Maritime Supply Chains from Counterterrorism: EU–U.S. Cooperation and the Emergence of a Transatlantic Customs Security Regime	(Anagnostakis, 2016)
4	Espionage and the optimal standard of the Customs-Trade Partnership against Terrorism (C-TPAT) program in maritime security	(Bagchi & Paul, 2017)
5	Maritime Law Enforcement by the Republic of Korea Concerning Proliferation of Weapons of Mass Destruction: Search and Interdiction	(Lee & Park, 2018)
6	Barriers and enablers for short sea shipping in the Southern African Development Community	(Konstantinus et al., 2019)
7	Intermodal maritime supply chains: assessing factors for resiliency and security	(Young & Gordon, 2020)
8	The limits of the multiple institutionalization of border control: A case study of immigration, customs, and the indonesian Maritime security agency in Batam, Indonesia	(Lay & Astrina, 2020)
9	Customer is king: promoting port policing, supporting hypercommercialism	(Eski, 2020)
10	Security in the maritime container supply chain: what is feasible and realistic?	(Mohseni et al., 2020)
11	Swedish reciprocal ransoms and multinational solutions to insecurity in the Mediterranean, c. 1720–1740	(Östlund, 2021)
12	'Diving for dope': Identity in submarine drug policing at the 'maritime gateway to Europe'	(Eski, 2022)
13	Securing containerized supply chain through public and private partnership	(Nikoofal et al., 2023)
14	Coastal State's (Criminal) Jurisdiction in the Exclusive Economic Zone: Recent Case-Law and State Practice	(Papastavridis, 2023)
15	Shadows in the Wheat Fields: Unravelling the Implications of Organized Crime in the Black Sea Grain Initiative	(Tuliakov, 2024)
16	Marine Security Model to Prevent Criminal Acts in Aceh	(Gausyah & Iqbal, 2024)
17	Overlapping Authorities In Maritime Law Enforcement: A Case Study Of Ternate City	(Mufti & Malik, 2025)

18	Exploring cyber security threats and security models in cross-border paperless maritime trade system	(Kayisoglu et al., 2025)
19	Examining the Level of Maritime Domain Awareness in Lake Victoria-Kenya	(Odanga & Dalaklis, 2025)

Picture 3 shows that a total of 19 Scopus-indexed journal articles addressed customs in maritime security during 2015–2025, providing the answer to RQ1. The number of publications during the early observation period (2015–2019) was relatively low and stable at approximately one to two articles per year before increasing sharply to four articles in 2020. After declining again in 2021–2022, the number of publications gradually increased from 2023 to 2025, reaching a second-highest level of three articles in 2025. This pattern indicates that academic interest in customs within the maritime security context has not developed linearly but appears to be influenced by the dynamics of global issues during particular periods.

The concentration of publications in 2020 can be interpreted as a convergence of previously developing research concerns, particularly maritime supply-chain resilience and security, institutionalized border control, port policing, and the feasibility of security measures in containerized trade. Although this temporal increase coincides with the heightened global attention to maritime supply-chain vulnerabilities during the COVID-19 period, the pattern should not be interpreted as a direct causal effect of the pandemic, but rather as an intensification of pre-existing research interests under a period of heightened systemic disruption. The three publications in 2025 reflect greater thematic diversification, encompassing overlapping maritime law-enforcement authorities, cybersecurity in cross-border paperless trade, and maritime domain awareness. Rather than representing a simple recovery in publication volume, this increase suggests a maturation of the research agenda toward more complex interactions among institutional authority, digital security, and continuous maritime situational awareness.



Picture 3. Articles on Customs in Maritime Security by Year, 2015–2025

RQ2: What were the trends in the relationships among research topics concerning customs in maritime security during 2015–2025?

The findings from the 19 journal articles were subsequently processed using VOSviewer to illustrate the existing research trends.

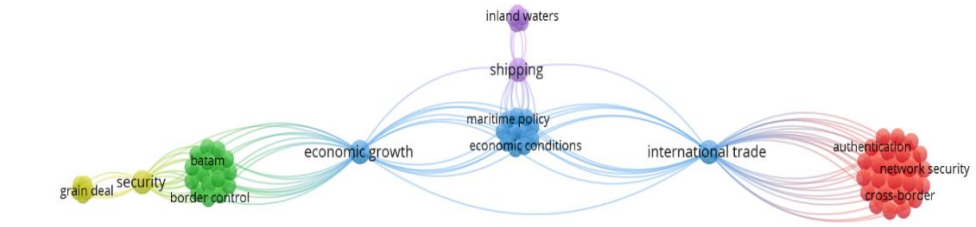
Table 5. Keyword Research and Affiliation-Relationship Analysis

No	Keyword	Occurrences	Total Link Strength
1	international trade	2	37
2	economic growth	2	30
3	authentication; cross-border; cross-border paperless trade; cross-border trades; cryptography; cybe security model; cyber security model; cybersecurity; electronic commerce; electronic data interchange; electronic trading; information management; information use; iso standars; management information systems; maritime cybe security; maritime cyber security; network security; paperless; real time systems; security modeling; security systems; security threat modeling	1	24
4	Security	2	22
5	maritime security; shipping	2	18
6	batam; border control; border region; customs; greater sunda islands; immigration; indonesia; Indonesian maritime security (bakamla); johor; malaysia; organization; riau islands; singapore [southeast asia]; Sumatera; sunda isles; west malaysia	1	17
7	c (programming language); commerce; customs-trade partnership against terrorisms; economic conditions; freight transport; geographical region; homeland security; maritime security; maritime policy; maritime transportation; merges and acquisitions; modal competition; national security; or in defense; parametric changes; palnning: government; policy development; policy making; public policy; short sea shipping; southern africa;southern African development community; supply chains; terrorism; terrorist groups	1	13
8	port security	2	8

9	artificial intelligence; chain costs; container supply chain; economic impact; electromechanical; scanning; screening; x-ray	1	7
10	container screening; crime prevention; customs diving team; discrete event simulation; drug trafficking; grain deal; identity; inland waters; lake victoria; maritime domain awareness; mda; monitoring and surveillance; non-intrusive inspection; odesa connection; organized crime; port of rotterdam; radiation isotope identification; radiation portal monitor; submarine policing; war	1	5
11	barbary captivity; diplomatic consul; exclusive economic zone; international law; jurisdiction; maritime law enforcement; piracy; private armed guards; ransom; republic of korea; search and interdiction; Swedish levant company; unconvention on the law of the sea; un security council sanctions; weapons of mass destruction	1	4
12	(hyper)commercialism; authority; coast; container transport; ethnography; frontline policing; incentive design; law enforcement; public-private partnership; risk and security management; sea	1	3
13	border areas; containerized cargo vulnerability; criminal act at sea; global supply chain security; policy; supply chain resiliency	1	2

The VOSviewer analysis shows the distribution of keywords, their number of occurrences, and their total link strength. The keywords “international trade” and “economic growth” have the highest total link strengths, at 37 and 30, respectively, indicating that these terms are the most strongly connected to other keywords in the research network. Keyword groups related to cybersecurity and cross-border trade, such as “cybersecurity,” “cross-border,” and “network security,” also show relatively strong connectivity (24), followed by “security” (22) and the “maritime security; shipping” group (18). The prominence of international trade and economic growth suggests that customs-related maritime security remains closely embedded in the governance of cross-border economic flows, while the strong connectivity of cybersecurity-related terms indicates an expanding concern with the protection of digitally mediated trade and security infrastructures. Taken together, these relationships suggest a conceptual transition in which maritime security is increasingly understood not only through the physical control of goods and maritime borders but also through the resilience and security of interconnected information and trade

systems. Overall, these patterns indicate that research on customs in maritime security is oriented toward three major issues: economics and trade, cybersecurity, and maritime security itself.



Picture 4. Keyword Affiliation-Relationship Map of Customs in Maritime Security

The Picture visualizes a keyword network divided into five color-coded clusters: the red cluster focuses on cybersecurity and cross-border paperless trade; the green cluster highlights border surveillance in the Indonesia–Malaysia–Singapore region; the blue cluster concerns maritime policy and economic growth; the yellow cluster addresses organized crime; and the purple cluster relates to maritime domain awareness in inland waters. The nodes “economic growth” and “international trade” appear to function as central connectors linking the clusters, indicating that economic issues constitute a point of intersection among security, policy, and border-governance dimensions in customs research within maritime security. The relatively linear structure of the network also indicates that research in this area remains distributed across relatively independent sub-topics and has not yet been extensively integrated.

The five clusters demonstrate that customs-related maritime security encompasses interconnected physical, institutional, economic, criminal, and digital dimensions, with each cluster representing a distinct layer of security governance. The central position of international trade and economic growth further indicates that these dimensions are connected primarily through the protection and regulation of cross-border flows, although the relatively differentiated clustering suggests that their integration within a unified research framework remains limited.

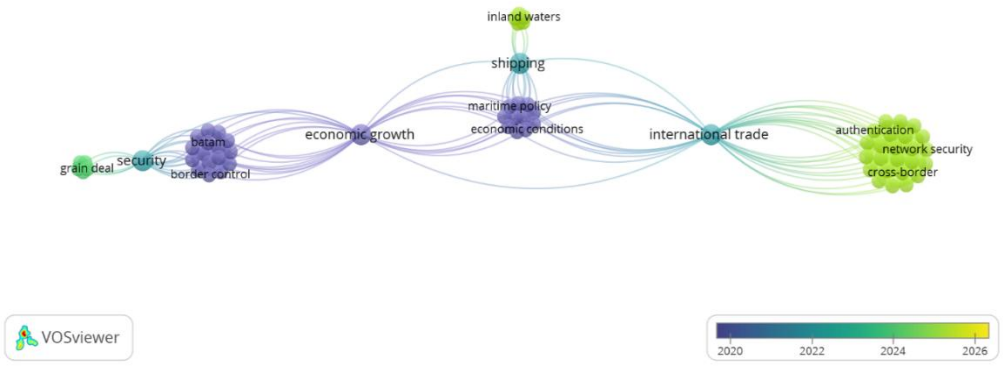
Table 6. Customs in Maritime Security Clusters Based on Keywords

Cluster Color	Keywords	Number	Percentage
Red	authentication; cross-border; cross-border paperless trade; cross-border trades; cryptography; cybe security model; cyber security; cyber security model; cybersecurity; electronic commerce; electronic data interchange; electronic trading; information management; information use; iso standards; management information systems; maritime cybe security; maritime cyber security; network security; paperless; real time systems; security modeling; security systems; security threat modeling	24	36,92%
Green	batam; border control; border region; customs; grater sunda islands; immigration; indonesia; Indonesian maritime security agency (bakamla); johor; malaysia; organization; riau islands; singapore [southeast asia]; sumatera; sunda isles; west Malaysia	16	24,62%
Blue	economic conditions; economic growth; freight transport; geographical region; international trade; maritime policy; maritime transportation; modal competition; policy development; policy making; short sea shipping; southern africa; southern Africa devepment community	13	20,00%
Yellow	crime prevention; grain deal; odesa connection; organised crime; security; war	6	9,23%

Purple	inland waters; lake victoria; maritime domain awareness; mda; monitoring and surveillance; shipping	6	9,23%

VOSviewer data processing identifies five keyword clusters along with their number and percentage contribution to the overall research network. The red cluster is dominant, comprising 24 keywords or 36.92%, all related to cybersecurity and cross-border paperless trade. It is followed by the green cluster with 16 keywords (24.62%), focusing on border surveillance in Indonesia and surrounding areas, and the blue cluster with 13 keywords (20.00%), addressing maritime policy and economic conditions. The yellow and purple clusters each contain six keywords (9.23%), focusing respectively on organized crime at sea and maritime domain awareness. These findings indicate that current research attention is most concentrated on cybersecurity within the customs and maritime security nexus.

The dominance of the cybersecurity cluster indicates that digital vulnerabilities have become a particularly prominent dimension of contemporary customs-related maritime security, while the substantial presence of border surveillance and economic-policy themes confirms the continuing importance of territorial control and trade governance. The smaller organized-crime and maritime-domain-awareness clusters should therefore be understood as more specialized thematic dimensions rather than as marginal concerns, reflecting the multidimensional composition of the field.

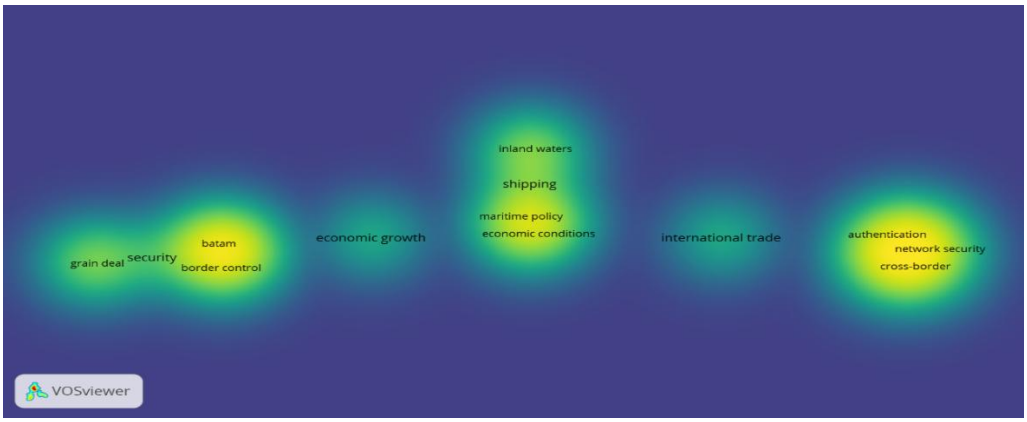


Picture 5. Temporal Trends in Keyword Affiliation Relationships

The overlay visualization illustrates the development of research keywords over time through a color gradient, with dark purple representing earlier periods and yellow representing more recent periods. Keywords such as “economic growth,” “maritime policy,” and “Batam” appear in purple to blue, indicating that these issues were increasingly discussed around 2020–2021. In contrast, keywords in the cluster comprising “authentication,” “network security,” and “cross-border” appear in green to bright yellow, indicating that research attention to cybersecurity in customs and

maritime trade developed more intensively during 2024–2025. This pattern suggests a shift in research orientation from conventional economic and policy issues toward more contemporary digital security concerns.

The temporal distribution suggests a substantive broadening of the research agenda, from earlier emphasis on economic growth, maritime policy, and localized border-control concerns toward more technologically mediated issues involving authentication, network security, and cross-border digital systems. This evolution indicates that the security function associated with customs is increasingly being conceptualized beyond physical border enforcement toward the protection of interconnected maritime trade and information infrastructures.



Picture 6. Density Visualization

The density and proximity of keywords can also be observed through the density visualization. Picture 6 presents the density visualization, which indicates the intensity of keyword occurrences and their proximity through a color gradient, where bright yellow areas represent the highest density and dark blue areas represent the lowest density. The highest density is visible in the “authentication, network security, cross-border” cluster and the “Batam, border control” cluster, indicating that these two groups of keywords occur most frequently and are most closely related in research on customs and maritime security. Conversely, the keywords “economic growth” and “international trade,” which function as inter-cluster connectors, exhibit lower visual density. This suggests that although these two issues are structurally central, their thematic depth remains less pronounced than that of the cybersecurity and border-surveillance clusters.

The contrast between high-density emerging security terms and the structurally central but comparatively lower-density themes of international trade and economic growth indicates a distinction between thematic centrality and research specialization. In this respect, trade and economic growth provide broad conceptual linkages across the literature, whereas cybersecurity, authentication, network security, and border-control themes reflect more concentrated areas of thematic development.

Overall, the bibliometric structure indicates that research on customs in maritime security has evolved from predominantly trade-, border-, and policy-oriented concerns toward a more technologically and institutionally complex agenda encompassing cybersecurity, cross-border digital systems, organized crime, and maritime domain awareness. Nevertheless, the differentiated thematic clusters and uneven

connectivity among them indicate that the field remains fragmented, with substantial scope for future research to integrate physical, digital, institutional, and information dimensions of maritime security within a more coherent analytical framework.

Conclusion

This study shows that research on customs in maritime security during 2015–2025 remains relatively limited but has demonstrated increasing academic attention, particularly since 2020. Based on the Systematic Literature Review (SLR) and bibliometric analysis of the Scopus database, 19 relevant articles were identified, covering container surveillance, border control, cross-border customs cooperation, maritime law enforcement, supply chain security, and maritime security governance. The bibliometric findings reveal five major research clusters: cybersecurity and cross-border paperless trade, border surveillance in Indonesia and surrounding areas, maritime policy and economic growth, organized crime, and maritime domain awareness. “International trade” and “economic growth” function as inter-cluster connectors, while cybersecurity and border surveillance exhibit stronger thematic density and connectivity. The temporal analysis also reveals a shift in research focus from economic and policy issues toward digital security, particularly “authentication,” “network security,” and “cross-border” during 2024–2025. Overall, research on customs in maritime security is multidimensional, but integration across sub-themes remains limited. This condition underscores the need for a more integrated research agenda linking customs, cybersecurity, border surveillance, international trade, and maritime security governance.

Reference

Anagnostakis, D. (2016). Securing the Transatlantic Maritime Supply Chains from Counterterrorism: EU–U.S. Cooperation and the Emergence of a Transatlantic Customs Security Regime. *Studies in Conflict and Terrorism*, *39*(5), 451–471. https://doi.org/10.1080/1057610X.2015.1108087

Arega, K. L., Beyene, A. M., & Yitagesu, S. (2024). Security Assurance in the Software Development Process: A Systematic Literature Review. *Communications in Computer and Information Science*, *2040*, 16–30. https://doi.org/10.1007/978-3-031-59107-5_2

Arifin, R., Hanita, M., & Runturambi, A. J. S. (2024). Maritime border formalities, facilitation and security nexus: Reconstructing immigration clearance in Indonesia. *Marine Policy*, *163*. https://doi.org/10.1016/j.marpol.2024.106101

Azarian, M., Yu, H., Shiferaw, A. T., & Stevik, T. K. (2023). Do We Perform Systematic Literature Review Right? A Scientific Mapping and Methodological Assessment. *Logistics*, *7*(4). https://doi.org/10.3390/logistics7040089

Bagchi, A., & Paul, J. A. (2017). Espionage and the optimal standard of the Customs-Trade Partnership against Terrorism (C-TPAT) program in maritime security. *European Journal of Operational Research*, *262*(1), 89–107. https://doi.org/10.1016/j.ejor.2017.03.014

Bolbot, V., Kulkarni, K., Brunou, P., Banda, O. V., & Musharraf, M. (2022). Developments and research directions in maritime cybersecurity: A systematic literature review and bibliometric analysis. *International Journal of Critical Infrastructure Protection*, *39*. https://doi.org/10.1016/j.ijcip.2022.100571

Carrera-Rivera, A., Ochoa, W., Larrinaga, F., & Lasa, G. (2022). How-to conduct a systematic literature review: A quick guide for computer science research. *Methodsx*, *9*. https://doi.org/10.1016/j.mex.2022.101895

Chakraborty, A., & Kar, A. K. (2024). How to Undertake an Impactful Literature Review:

Understanding Review Approaches and Guidelines for High-impact Systematic Literature Reviews. *South Asian Journal of Business and Management Cases*, *13*(1), 18–35. https://doi.org/10.1177/22779779241227654

Dayan, E., & Rubin, A. (2026). Complexities of governance and sovereignty in maritime security. *Marine Policy*, *187*. https://doi.org/10.1016/j.marpol.2026.107066

Eski, Y. (2020). Customer is king: promoting port policing, supporting hypercommercialism. *Policing and Society*, *30*(2), 153–168. https://doi.org/10.1080/10439463.2019.1606808

Eski, Y. (2022). 'Diving for dope': Identity in submarine drug policing at the 'maritime gateway to Europe.' *European Journal of Criminology*, *19*(1), 139–159. https://doi.org/10.1177/1477370819887513

García-Peñalvo, F. J. (2022). Developing robust state-of-the-art reports: Systematic Literature Reviews. *Education in the Knowledge Society*, *23*, E28600. https://doi.org/10.14201/eks.28600

Gausyah, M., & Iqbal, M. (2024). MARINE SECURITY MODEL TO PREVENT CRIMINAL ACTS IN ACEH. *Petita: Jurnal Kajian Ilmu Hukum Dan Syariah*, *9*(1), 232–249. https://doi.org/10.22373/petita.v9i1.261

Jizba, M., Cheu, R. L., Horak, T., & Binova, H. (2015). Analysis of screening checkpoint operations for transatlantic container transportation. *Journal of Transportation Security*, *8*(3–4), 79–97. https://doi.org/10.1007/s12198-015-0159-5

Kayisoglu, G., Duzenli, E., Bolat, P., & Bondarenko, A. (2025). Exploring cyber security threats and security models in cross-border paperless maritime trade system. *Computers and Security*, *157*. https://doi.org/10.1016/j.cose.2025.104604

Konstantinus, A., Zuidgeest, M., Christodoulou, A., Raza, Z., & Woxenius, J. (2019). Barriers and enablers for short sea shipping in the Southern African Development Community. *Sustainability (Switzerland)*, *11*(6). https://doi.org/10.3390/su11061532

Lay, C., & Astrina, A. R. (2020). The limits of the multiple institutionalization of border control: A case study of immigration, customs, and the indonesian Maritime security agency in Batam, Indonesia. *Pacific Affairs*, *93*(1), 113–134. https://doi.org/10.5509/2020931113

Lee, S., & Park, E. (2018). Maritime Law Enforcement by the Republic of Korea Concerning Proliferation of Weapons of Mass Destruction: Search and Interdiction. *Pacific Focus*, *33*(3), 478–496. https://doi.org/10.1111/pafo.12129

McAllister, J. T., Lennertz, L., & Atencio Mojica, Z. (2022). Mapping A Discipline: A Guide to Using VOSviewer for Bibliometric and Visual Analysis. *Science and Technology Libraries*, *41*(3), 319–348. https://doi.org/10.1080/0194262X.2021.1991547

Mohseni, S. A., Onghena, E., van Hassel, E., & Vanelslander, T. (2020). Security in the maritime container supply chain: what is feasible and realistic? *Journal of Transportation Security*. https://doi.org/10.1007/s12198-019-00206-x

Mufti, A., & Malik, F. (2025). Overlapping Authorities In Maritime Law Enforcement: A Case Study Of Ternate City. *Administrative and Environmental Law Review*, *6*(2), 91–104. https://doi.org/10.25041/aelr.v6i2.4192

Nikoofal, M. E., Pourakbar, M., & Gumus, M. (2023). Securing containerized supply chain through public and private partnership. *Production and Operations Management*, *32*(7), 2341–2361. https://doi.org/10.1111/poms.13980

Odanga, J. O., & Dalaklis, D. (2025). Examining the Level of Maritime Domain Awareness in Lake Victoria-Kenya. *Journal of Maritime Research*, *22*(2), 286–295. https://www.scopus.com/pages/publications/105022443042?origin=resultslist

Östlund, J. (2021). Swedish reciprocal ransoms and multinational solutions to insecurity in the Mediterranean, c. 1720–1740. *Journal of the British Academy*, *9*(S4), 151–167. https://doi.org/10.5871/jba/009s4.151

Paget, S. (2016). The 'best small nation navy in the world'? The twenty-first century Royal New Zealand Navy. *Australian Journal of Maritime and Ocean Affairs*, *8*(3), 230–256. https://doi.org/10.1080/18366503.2016.1217385

Papastavridis, E. (2023). Coastal State's (Criminal) Jurisdiction in the Exclusive Economic Zone: Recent Case-Law and State Practice. *Zeitschrift Fur Auslandisches Offentliches Recht Und Volkerrecht*, *83*(2), 307–331. https://doi.org/10.17104/0044-2348-2023-2-307

Schweizer, M. L., & Nair, R. (2017). A practical guide to systematic literature reviews and meta-analyses in infection prevention: Planning, challenges, and execution. *American Journal of Infection Control*, *45*(11), 1292–1294. https://doi.org/10.1016/j.ajic.2017.08.004

Thomé, A. M. T., Scavarda, L. F., & Scavarda, A. J. (2016). Conducting systematic literature review in operations management. *Production Planning and Control*, *27*(5), 408–420. https://doi.org/10.1080/09537287.2015.1129464

Triandini, E., Jayanatha, S., Indrawan, A., Werla Putra, G., & Iswara, B. (2019). Metode Systematic Literature Review untuk Identifikasi Platform dan Metode Pengembangan Sistem Informasi di Indonesia. *Indonesian Journal of Information Systems*, *1*(2), 63. https://doi.org/10.24002/ijis.v1i2.1916

Tuliakov, V. (2024). Shadows in the Wheat Fields: Unravelling the Implications of Organized Crime in the Black Sea Grain Initiative. *Journal of Illicit Economies and Development*, *6*(2), 89–104. https://doi.org/10.31389/jied.241

van Eck, N. J., & Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics*, *84*(2), 523–538. https://doi.org/10.1007/s11192-009-0146-3

Young, R. R., & Gordon, G. A. (2020). Intermodal maritime supply chains: assessing factors for resiliency and security. *Journal of Transportation Security*, *13*(3–4), 231–244. https://doi.org/10.1007/s12198-020-00224-0