

Tariff Classification Disputes In The Harmonized System: A Scoping Review

Ginda Sitorus¹, Yulianti²

University of Indonesia, Jl. Salemba Raya No.4, DKI Jakarta, 10430, Indonesia^{1,2}

[^{1,2}Ginda.sitorus@ui.ac.id](mailto:Ginda.sitorus@ui.ac.id)

Abstract

Purpose: Examine and synthesize existing literature on tariff classification disputes in the Harmonized System (HS)

Methodology/approach: Using the scoping review framework proposed by Arksey and O'Malley, relevant studies were systematically collected from major databases including Scopus, ProQuest, Google Scholar, and the World Customs Journal. A total of 19 articles met the inclusion criteria.

Results/findings: Based on key themes, the main causes include differing interpretations of HS provisions, the complexity of the system, limited technical capacity, and rapid technological advancements. The consequences encompass legal uncertainty, unpredictable trade costs, and procedural delays that hinder regulatory consistency and trade efficiency. Institutional coordination, regulatory reforms and technological innovation are essential for resolution.

Conclusions: Improving institutional coordination, implementing regulatory reforms, and leveraging technological innovation are crucial measures to reduce tariff classification disputes and enhance the effectiveness of the Harmonized System.

Limitations: This review is limited to studies published in selected databases and does not include unpublished or non-English sources, which may restrict the comprehensiveness of the findings.

Contribution: Contributes to the understanding of tariff classification disputes in Harmonized System by highlighting key themes in the literature and offering insights for policymakers, customs administrations and future researchers.

Keywords: *Literature Review, Tariff Classification Disputes, Harmonized System, HS Code, Customs*

1. Introduction

Contemporary global trade is characterized by a significant acceleration in the movement of goods and services across regions and national borders (Bezrukova et al., 2024). In the context of the exchange of goods in international trade, transactions are not conducted directly therefore language barriers and the specific characteristics of the goods become significant obstacles. One way to address this issue is by establishing a common business or technical language for global trade (Guilherme Moreno Caiado, 2012). The most widely used system is the Harmonized System (HS) which was developed by the World Customs Organization (WCO). HS is based on a six-digit numerical code together with standard terms that are used to describe and identify commodities used in international trade and also has own common vocabulary to describe and denote goods crossing international borders.

At present, the HS covers more than 5,000 commodity groups identified by six-digit codes, known as HS Codes, arranged in a legally and logically structured manner, and accompanied by rules designed to ensure uniform classification. Each country or economy may extend the six-digit HS Code by adding two or more digits to accommodate its tariff, statistical, and national policy requirements. The Harmonized HS is utilized by more than 200 countries and economies as the foundational instrument for tariff determination and trade statistics compilation, functioning as the principal classification framework for over 98 percent of global merchandise trade (WCO, 2025). The HS Code classification system has become a useful tool for trade data processing, tariff determination, and negotiations in international trade (Shumba, 2024). The World Customs Organization (WCO) updates the Harmonized System (HS) through a five-year review cycle, with the latest edition of the HS Code having entered into force on 1 January 2022 (WCO, 2025).

As the basis for tariffs and a key instrument of international trade, the classification of goods within the Harmonized System has become essential. For customs authorities, tariff classification within the Harmonized System is crucial, as it determines whether taxes will or will not be imposed on particular goods, and also affects compliance-related matters such as required government approvals, statistical needs, free trade agreements, and other regulatory considerations (Wagner, 2023). In addition, for importers and exporters, tariff rates are directly linked to the price of goods, which can in turn affect global competitiveness (Lee et al., 2023). Tariff classification based on the Harmonized System is a highly technical and complex activity for customs authorities. The application of tariff classification based on international provisions often results in differences among stakeholders, including customs authorities, importers, and judicial institutions (Colesky & Franzsen, 2022). Participants in international trade are often confronted with uncertainty, as the classification of goods is not always definitive or indisputable (Chen, 2016).

Differences in the application of tariff classification often led to disputes. Disputes concerning tariff classification may arise not only at the international level but also at the national level (Shakhnazarov, 2024). Such disputes create uncertainty for global companies, hinder trade efficiency, and complicate compliance with customs regulations (Kim et al., 2015). In view of the consequences arising from tariff classification disputes, this article aims to examine existing literature in order to provide a more comprehensive overview of such disputes, identify key factors influencing disputes and highlight the causes and mitigation strategies associated with tariff classification disputes which could be useful for customs institutions, policymakers, and researchers who seek to enhance understanding and improve the management of customs-related issues. Accordingly, this study seeks to answer the following research questions: (1) “How is the research profile regarding tariff classification disputes in Harmonized System” and (2) “What is known from the literature about the tariff classification disputes?”.

This article is structured as a scoping review to systematically map the available literature on tariff classification disputes. The objective of this scoping review is to provide an overview of tariff classification disputes as examined in previous studies across different countries. By employing this approach, the article not only provides a conceptual synthesis but also serves as a basis for addressing broader inquiries raised by researchers and policymakers (Pollock et al., 2024) and provides a foundation for more comprehensive and evidence-based future research and policy agendas. (Levac et al., 2010). Although the scoping review is a relatively new approach in the synthesis of scientific evidence (Munn et al., 2018), the main objective of a scoping review is to explore and delineate the scope of existing knowledge on a given topic within a specific discipline by systematically identifying, categorizing, and mapping the breadth of available evidence pertaining to that topic, concept, or issue frequently without regard to the origin of the evidence, whether it arises from within or across particular contexts (Sharma & Goyal, 2023).

2. Literature review and hypothesis/es development

Although this article does not test any hypothesis, it follows the intent of this section by reviewing previous research and identifying conceptual gaps using a scoping review approach. As outlined by Arksey and O'Malley (2005), a scoping review systematically maps the breadth and nature of existing knowledge to identify key concepts and research gaps rather than evaluate the quality of studies or test causal relationships. This approach is particularly suitable when the available literature is fragmented or lacks synthesis, as it enables a comprehensive understanding of what has been studied and where gaps remain.

Over the past decade, studies have emphasized the critical role of the Harmonized System (HS) in facilitating global trade (Shumba, 2024) and have highlighted persistent inconsistencies in tariff classification practices (Chen, 2016; Weerth, 2017). However, no comprehensive synthesis has systematically mapped the literature to examine the causes, impacts, and mitigation strategies of tariff classification disputes across countries and institutional settings. Therefore, this study adopts a scoping review framework to address this research gap by mapping existing evidence and identifying thematic patterns in the literature.

3. Methodology

This study employs a descriptive analysis using a scoping review approach. The scoping review possesses several advantages compared to other forms of literature review. This methodological approach is especially appropriate for comprehensively understanding and elucidating the characteristics, nature, and diversity of a particular field or topic (Gutierrez-Bucheli et al., 2022). The use of a scoping review can also enhance transparency in the process of conducting a literature review. (Arksey & O'Malley, 2005). The scoping review integrates evidence from both research-based and non-research-based sources (Davis et al., 2009). This study adopts the six-stage framework proposed by Arksey and O'Malley (2005), as illustrated in Figure 1.

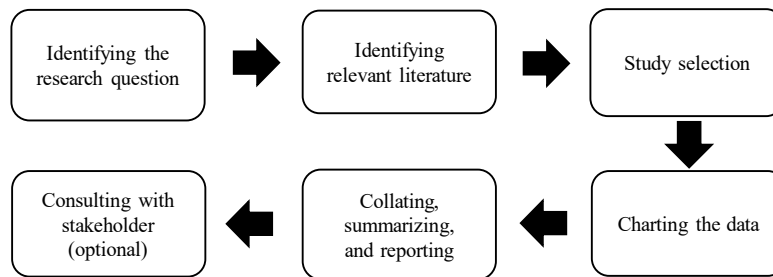


Figure 1. Stages of the Scoping Review
Source: Figure by author

Stage 1: Identifying the Research Question

The initial stage of a scoping review involves formulating the research question to be addressed. In this study, a broad research question was first established with the objective of exploring the overall landscape of tariff classification disputes. In accordance with the iterative nature of the scoping review framework proposed by Arksey and O'Malley (2005), the research questions were subsequently refined throughout the review process. As the analysis of the literature progressed, three major thematic key themes were identified. The research questions addressed in this study are as follows:

1. How is the research profile regarding tariff classification disputes in Harmonized System?
2. What is known from the literature about the tariff classification disputes?

Stage 2: Identifying relevant literature

In Arksey & O'Malley framework, the scoping review does not assess the quality of the literature. Thus, the literature used in this review were sourced not only from reputable online research databases, such as Scopus and ProQuest, but also grey literature, for example official publications from the World Customs Organization, namely World Customs Journal, also article or theses found on Google Scholar. To find relevant articles much faster and with more precision about tariff classification dispute, primarily this review used this keyword combination with period from 2010 to 2024: ("tariff classification dispute" OR "HS code dispute" OR "Harmonized System classification" OR "customs classification dispute"). However, specifically for Scopus, to narrow the scope of the study, the keywords used are ("Tarif classification dispute" OR "HS code dispute" OR "Harmonized System classification" AND "customs"). In addition, a literature search was also conducted through the Google search engine to identify relevant literature for the review.

Stage 3: Study selection

At the third stage, the literature was selected to obtain studies that could answer the formulated research questions. This step requires a mechanism to help researchers eliminate references that are not relevant to the research objectives (Arksey & O'Malley, 2005). The purpose of this study is to collect comprehensive literature evidence however, cost and time constraints must be taken into consideration in conducting the research (O'Flaherty & Phillips, 2015). Therefore, this study applied inclusion and exclusion criteria in the selection of literature to ensure alignment with the research objectives. The complete list of inclusion and exclusion criteria is presented in Table 1.

Table 1. Inclusion and Exclusion Criteria

Criteria	Inclusion	Exclusion
Period	2010-2024	Before 2010 dan After 2024
Language	English	Non-English languages
Type of literature	All types of literature	Literature without accessible full text
Scope	Country or regional level	City, provincial, or state level
Methodology	All research methodologies	-

Source: Table by author

This study adopted the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework to guide the literature selection process, drawing on the original model developed by Moher et al. (2009) and the revised version introduced by Page et al. (2021). The application of the PRISMA diagram enhances transparency and methodological clarity in the literature selection process. Figure 2 presents the literature screening process as depicted through the PRISMA framework.

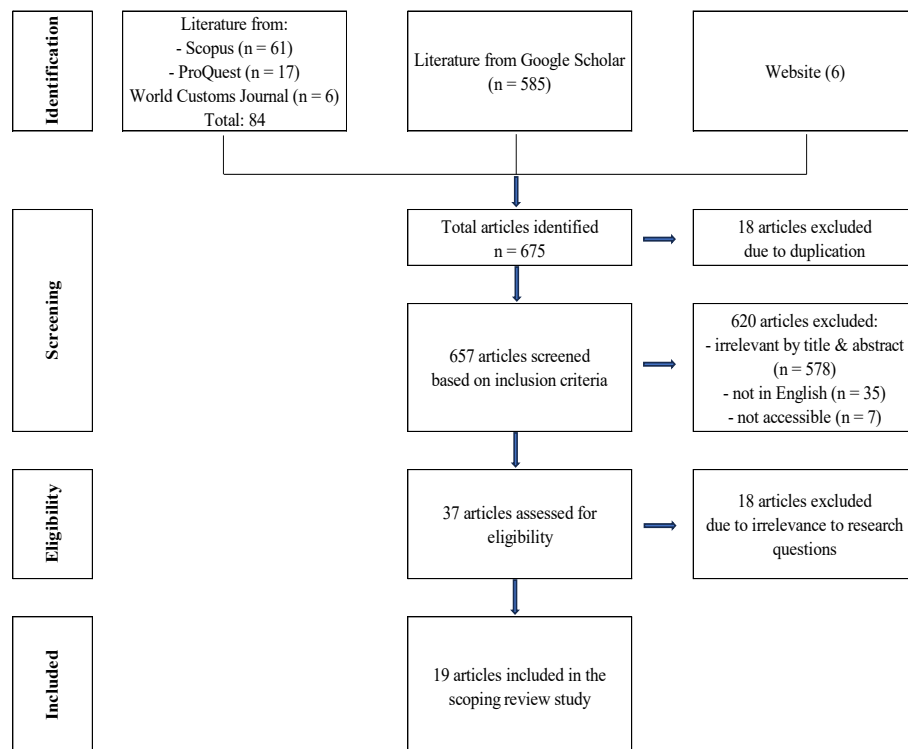


Figure 2. PRISMA Flow Diagram

Source: Figure by author

The literature selection process was conducted in multiple screening stages to identify studies relevant to the research topic. A total of 675 records were retrieved from four databases and additional sources. Following the removal of 18 duplicate records, 657 studies remained for further screening. Based on the inclusion criteria, 620 studies were excluded for not meeting eligibility requirements, leaving 37 studies for evaluation against the formulated research questions. After a thorough assessment of these 37 studies, 18 were excluded from the final analysis due to irrelevance to the research objectives. Consequently, nineteen studies were retained as the core dataset for this scoping review, and the full texts of all selected studies were successfully obtained for detailed examination.

Stage 4: Charting the data

In this stage, details from the relevant articles were extracted in a spreadsheet or databases flexibly based on the focus of the research questions (Armstrong et al., 2011). Table 2 presents a summary of the nineteen references used in the scoping review process.

Table 2. Literature Details

Author(s)	Year	Location	Type	Methodology	Key Theme
Weerth	2018	Not Specified (Global)	Journal Article	Qualitative	Impact & Mitigation
Kuznetsova & Gustova	2021	Eurasian Economic Union	Conference Proceedings	Qualitative	Cause & Impact & Mitigation
Stehlíček	2017	European Union	Thesis	Qualitative	Cause & Mitigation
Kim et al.	2015	South Korea	Journal Article	Qualitative	Cause & Mitigation
Grainger	2024	Not Specified (Global)	Journal Article	Qualitative	Mitigation
Liao et al.	2024	China	Journal Article	Quantitative	Mitigation
Karavayev et al.	2023	Ukraine	Journal Article	Qualitative	Mitigation
Guilherme Moreno Caiado	2012	Not Specified (Global)	Journal Article	Qualitative	Cause & Impact & Mitigation
Weerth	2017	European Union	Journal Article	Qualitative	Cause & Impact & Mitigation
Chen	2016	European Union, China Taiwan	Journal Article	Qualitative	Cause & Impact & Mitigation
Dominguez Prost & Scattolo	2024	Argentina	Journal Article	Quantitative	Cause & Mitigation
Bakhru & Sharma	2024	India	Legal case report	Qualitative	Cause & Impact & Mitigation
Shakhnazarov	2024	Not Specified (Global)	Journal Article	Qualitative	Cause & Mitigation
Nugrahaeni & Tjen	2021	Indonesia	Journal Article	Qualitative	Cause & Mitigation
Brigstock	2017	European Union	Thesis	Qualitative	Cause & Impact & Mitigation
Kappler	2011	Zambia	Journal Article	Qualitative	Cause & Mitigation
Neville	2016	USA	Journal Article	Qualitative	Cause & Impact & Mitigation
Colesky & Franzsen	2022	South Africa	Journal Article	Qualitative	Cause & Mitigation
Neville	2012	Not Specified (Global)	Journal Article	Qualitative	Cause & Mitigation

Source: Figure by author

2.5. Stage 5: Collating, summarizing, and reporting

Finally, the last part of the scoping review is collating, summarizing, and reporting results of the review based on the research questions. The results of this scoping review are shown in two ways. First, this review presents the basic numerical analysis about the profiles of the relevant studies, produced in tables and figures. Second, the literatures are organized systematically according to the key themes found in the studies.

4. Results and discussion

4.1. Literature profile

Figure 3 presents the distribution of articles by research location, categorized by country and region. Among the twelve studies analyzed, global-level research accounts for the largest proportion, with five studies conducted at the global scale. The European Union follows as the second most frequently studied region, with four studies. The United States, Zambia, Ukraine, Taiwan, South Korea, South Africa, Indonesia, India, China, and Argentina each contributed one study. In addition, one study focused on the Eurasian Economic Union as its research region. This distribution illustrates that research on tariff classification disputes is geographically dispersed across continents. Such a widespread distribution is likely attributed to the extensive adoption of the Harmonized System (HS) Code as a common trade language for goods in nearly all countries worldwide.

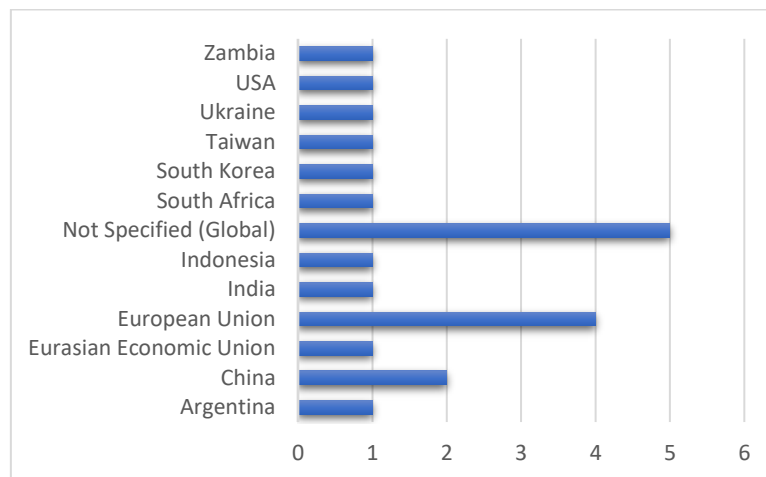


Figure 3 Distribution of Studies
Source: Figure by author

With regard to the year of publication, as presented in Figure 4, research addressing tariff classification disputes within this scoping review began in 2011 with one study, while no related studies were identified in 2010. The period concludes in 2024, which recorded the highest number of publications, totalling five studies. Overall, from 2011 to 2024, there has been at least one study on tariff classification disputes each year, indicating a sustained academic interest likely associated with the increasing complexity of international trade.

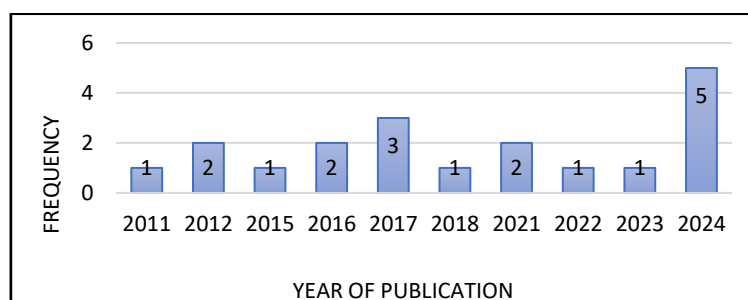


Figure 4 Research Trend

Source: Figure by author

Research design mapping reveals that studies included in this scoping review predominantly used qualitative methods ($n = 17$) compared to quantitative methods ($n = 2$), while no study explicitly adopted a mixed-methods approach. Most qualitative studies employed descriptive and analytical techniques to explore research phenomena, often relying on document review, interviews and interpretative analysis to understand meaning and context in depth (Weerth, 2018; Kuznetsova & Gustova, 2021; Stehlíček, 2017; Kim et al., 2015; Grainger, 2024; Karavayev et al., 2023; Guilherme Moreno Caiado, 2012; Weerth, 2017; Chen, 2016; Bakhru & Sharma, 2024; Shakhnazarov, 2024; Nugrahaeni & Tjen, 2021; Brigstock, 2017; Kappler, 2011; Neville, 2016; Colesky & Franzsen, 2022; Neville, 2012). On the other hand, quantitative studies focused on computational and statistical analyses to examine their data (Liao et al., 2024; Dominguez Prost & Scattolo, 2024). The dominance of qualitative research underscores the interpretive nature of the topic examined. Nevertheless, the limited number of quantitative studies presents opportunities for future research to adopt more diverse methodologies, thereby contributing to a more balanced and comprehensive understanding of the subject across different contexts.



Figure 5 Research Methodologies

Source: Figure by author

The distribution of literature types reveals a predominance of journal articles ($n = 15$), followed by theses ($n = 2$), a legal case report ($n = 1$), and a conference proceeding ($n = 1$). The dominance of journal publications indicates that research on this topic is primarily disseminated through peer-reviewed outlets. Meanwhile, the limited number of theses and other materials suggests that the field remains underexplored at postgraduate and applied levels. The inclusion of legal and conference papers, though minimal, reflects emerging interdisciplinary interest. This pattern highlights the need for more diverse publication sources to achieve a broader and more balanced understanding of the topic.

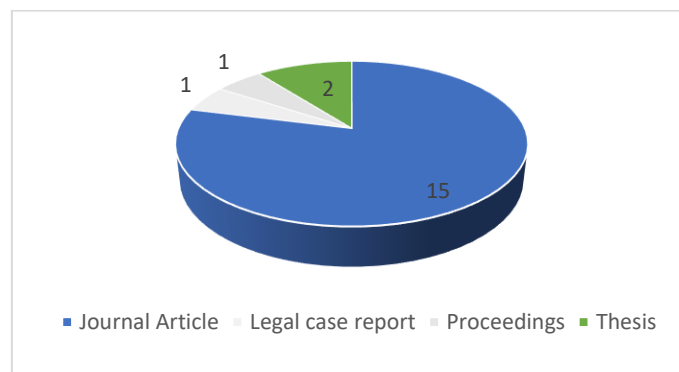


Figure 5 Types of Studies

Source: Figure by author

4.2. Key themes about the tariff classification disputes in Harmonized System

The analysis and comprehensive review of 19 studies led to the identification of three key themes related to the tariff classification disputes in Harmonized System. These key themes include the causes of tariff classification disputes, the impacts of the disputes, and the mitigation strategies to minimize such disputes.

4.2.1. Causes of tariff classification disputes in Harmonized System

Differences in the application of tariff classification within the Harmonized System (HS) often lead disputes. These differences are partly caused by the lack of harmonisation in terminology and technical definitions across legal instruments, national standards, and explanatory notes generates ambiguity and varying interpretations among traders and customs authorities (Kuznetsova & Gustova, 2021). Moreover, the legal and structural complexity of the HS and Combined Nomenclature (CN) systems further cause these challenges, particularly when products possess multiple functional or technological characteristics that complicate the determination of their principal function and appropriate classification (Chen, 2016; Stehlíček, 2017; Kim et al., 2015; Weerth, 2017; Bakhru & Sharma, 2024; Neville, 2012).

Tariff classification disputes also frequently occur between importers and customs authorities, as importers tend to select HS codes with lower tariffs while authorities are inclined to apply higher-tariff classifications, creating tensions in duty determination (Kim et al., 2015). In addition, inconsistencies in classification decisions across jurisdictions (Chen, 2016), divergent interpretation methods, high trade volumes, and limited time for classification decisions, along with expedited cargo processing through automated clearance systems that reduce the depth of review, importers' insufficient knowledge of HS codes, incomplete import documentation, and regulatory loopholes exploited by importers (Nugrahaeni & Tjen, 2021), all contribute to the tariff classification disputes. Tariff dispersion across HS positions also contributes to disputes, as significant variations in duty rates encourage reclassification attempts or import duty evasion (Dominguez Prost & Scattolo, 2024).

Rapid technological developments and the emergence of new products often render existing classification rules inadequate (Brigstock, 2017). Ambiguity over whether "use" should influence *eo nomine* classification creates uncertainty between identity-based and use-based interpretations constitutes another reason for tariff classification disputes (Neville, 2016). Colesky & Franzsen (2022) notes that tariff classification is a highly technical and complex process governed by both national and international law resulting in disputes. Kappler (2011) indicates that complexity of the Harmonized System (HS), inconsistencies or definitional gaps within the nomenclature and product descriptions, reliance on third parties for tariff classification and customs compliance by importers, improper tools and lack of oversight by importers contribute of classification disputes. Divergences in tariff classification interpretation may arise not only at the international level but also within domestic jurisdictions, conflicting interests between customs authorities and traders frequently generate disputes (Shakhnazarov, 2024). In International context, states may now exploit tariff classification changes as a means of opportunistically deviating from their WTO trade commitments (Guilherme Moreno Caiado, 2012).

4.2.2. Impact of tariff classification disputes in Harmonized System

Tariff classification disputes have wide-ranging implications for international trade. Traders face uncertainty in tariff classification, unpredictable trade costs, and a higher likelihood of customs disputes (Weerth, 2018). Such disputes have a direct impact on import duty rates and frequently give rise to legal challenges (Kuznetsova & Gustova, 2021). They also undermine global uniformity and the efficiency of trade regulation (Guilherme Moreno Caiado, 2012), creating risks of disharmony and inconsistent interpretation in the application of classification by traders and customs authorities (Weerth, 2017). Unclear criteria for applying "use" in *eo nomine* provisions result in misclassification, legal disputes, and inconsistent enforcement (Neville, 2016). Moreover, classification inconsistencies and misinterpretation of an article's essential character can lead to legal disputes and erode predictability in customs rulings (Bakhru & Sharma, 2024). The lack of legal consistency and uniform approaches

may also increase opportunities for tax fraud (Brigstock, 2017). Finally, these inconsistencies contribute to delays, increased costs, and legal uncertainty, which discourage trade and investment (Chen, 2016).

4.2.3. Mitigation strategies

The mitigation of tariff classification disputes requires a multidimensional approach that combines regulatory reform, institutional coordination and technological innovation. The implementation of binding advance rulings under the WTO Trade Facilitation Agreement (TFA), supported by the World Customs Organization (WCO), is considered a key measure to promote uniformity and predictability in tariff classification (Weerth, 2018). Binding preliminary decisions issued by customs authorities and the harmonization of terminology among relevant parties are also essential to ensure consistent interpretation (Kuznetsova & Gustova, 2021). Accurately identifying a product's main function is crucial in preventing classification disputes (Stehlíček, 2017), while importers are encouraged to utilize advance rulings and seek professional assistance from customs brokers to ensure compliance, meanwhile customs authorities should maintain neutrality and objectivity in their assessments to avoid tariff- or revenue-driven bias (Kim et al., 2015).

The use of technology also plays a crucial role in mitigating tariff classification disputes. The responsible integration of artificial intelligence (AI) and digital platforms can automate classification, enhance accuracy, and improve trade efficiency (Grainger, 2024). Deep learning models with multiscale attention such as EBLCS have been proposed to reduce human error and expedite processing (Liao et al., 2024). Similarly, the modernization of expert examination systems through the digitalization of laboratory results, enhanced technical competencies among customs officers, and the harmonization of analytical methods with EU standards can significantly increase accuracy and efficiency in trade classification (Karavayev et al., 2023).

Institutional and legal reforms are equally critical. Strengthening collaboration between the WCO and WTO could help integrate technical and legal aspects of tariff governance and support the establishment of a joint dispute settlement or oversight mechanism (Guilherme Moreno Caiado, 2012). The use of additional explanatory notes to clarify product definitions and analytical methods also enhances transparency (Weerth, 2017). Furthermore, the establishment of advance ruling systems with sufficient legitimacy for economic operators (Chen, 2016) and consistent application of the *essential character* principle supported by enhanced training on the General Rules for Interpretation (GRI) and alignment with WCO standards are vital to ensuring legal certainty (Bakhru & Sharma, 2024). In addition, measures such as amending relevant regulations to prevent misuse of legal loopholes, improving cooperation with the WCO, and providing free access to HS references have been recommended (Nugrahaeni & Tjen, 2021). Centralizing and strengthening tariff classification procedures, encouraging professional consultation for economic operators, and promoting collaboration between national authorities and international bodies are also essential to ensure global coherence in classification (Brigstock, 2017). Moreover, addressing inconsistencies in the treatment of products with different tariff lines or import tariffs for “similar products” classified through the red lanes is necessary to promote transparency and equitable tariff application (Dominguez Prost & Scattolo, 2024).

Finally, adopting corrective mechanisms such as risk management frameworks, post-entry audits, pre-shipment inspections, and the introduction of incentive and penalty systems can improve compliance and minimize disputes. These may be complemented by manual review procedures, automated HS error detection tools, and the implementation of the 3CE methodology (Kappler, 2011). Establishing independent expert tribunals can further provide efficient, specialized and cost-effective resolution between administrative appeals and litigation (Colesky & Franzsen, 2022). Ultimately, a comprehensive understanding of the legal and institutional evolution of tariff regulation under the WCO remains fundamental to preventing and resolving classification disputes (Neville, 2012; Neville, 2016; Shakhnazarov 2024).

5. Conclusion

5.1. Conclusion

This scoping review provides a comprehensive overview of tariff classification disputes within the Harmonized System (HS) by mapping existing literature to identify their causes, impacts and mitigation strategies. The findings reveal that tariff classification disputes primarily arise from inconsistencies in interpretation, lack of harmonization in terminology and technical definition, and the inherent legal and structural complexity of the HS. Differences in interpretation among customs authorities, importers, and judicial bodies, along with insufficient technical capacity, inadequate documentation and exploitation of regulatory loopholes, further contribute to classification conflicts. In addition, rapid technological development and the emergence of new products often render existing rules inadequate, leading to ambiguity in determining the appropriate classification.

These disputes have significant implications for international trade including legal uncertainty, unpredictable trade costs, and increased risks of customs conflict. Such inconsistencies undermine global uniformity, disrupt regulatory efficiency, and erode trust between customs authorities and traders. They may also lead to misclassification, legal disputes, delays, increased operational costs, and even opportunities for tax fraud. To address these challenges, a multidimensional mitigation strategy is required, encompassing regulatory, institutional and technological approaches. Strengthening cooperation between the World Customs Organization (WCO) and the World Trade Organization (WTO), implementing binding advance rulings under the Trade Facilitation Agreement (TFA) and harmonizing technical terminologies are key to promoting consistency and predictability. Moreover, the integration of artificial intelligence (AI), digitalization of customs processes, and enhancement of human resource competencies can improve classification accuracy and efficiency. A comprehensive understanding of the legal and institutional evolution of the Harmonized System remains essential for ensuring fair, transparent and uniform tariff classification across jurisdictions.

5.2. Limitation

This review acknowledges several limitations. The scope of the literature analyzed was limited to studies published between 2010 and 2024, focusing mainly on English-language sources obtained from selected databases such as Scopus, ProQuest, and Google Scholar. The predominance of qualitative research and limited availability of quantitative data may restrict the generalizability of the findings. Furthermore, this review followed only the first five stages of Arksey and O'Malley's (2005) framework, excluding the optional sixth stage involving expert consultation, which could have provided additional validation and contextual insights. Therefore, the results of this review should be interpreted within these methodological constraints.

5.3. Suggestion

Future research should adopt broader and more inclusive approaches by expanding search databases, incorporating multilingual sources, and integrating both qualitative and quantitative methodologies to achieve a more comprehensive understanding of tariff classification disputes. Collaboration between academia, customs practitioners, and policymakers is strongly encouraged to bridge the gap between theory and practice. Future studies may also explore the practical application of digital and AI-based classification systems, assess their effectiveness in dispute prevention, and evaluate the role of international cooperation between the WCO, WTO, and national customs authorities in ensuring harmonized and transparent classification. Finally, strengthening institutional capacity, improving the clarity of legal frameworks, and fostering consistent interpretation of the Harmonized System are key strategies to minimize disputes and support a more efficient and predictable global trade environment.

Acknowledgment

The authors would like to express their gratitude to University of Indonesia and the Indonesia Endowment Fund for Education (LPDP) for their support and contribution to the completion of this research.

References

- Arksey, H., & O'Malley, L. (2005). Scoping studies: towards a methodological framework. *International Journal of Social Research Methodology*, 8(1), 19–32.
<https://doi.org/10.1080/1364557032000119616>
- Armstrong, M. J., Mottershead, T. A., Ronksley, P. E., Sigal, R. J., Campbell, T. S., & Hemmelgarn, B. R. (2011). Motivational interviewing to improve weight loss in overweight and/or obese patients: a systematic review and meta-analysis of randomized controlled trials. *Obesity Reviews*, 12(9), 709–723. <https://doi.org/https://doi.org/10.1111/j.1467-789X.2011.00892.x>
- Bakhru, V., & Sharma, K. (2024). *Integrated Circuit Micro Electro Mechanical System Microphones is classifiable under CTH 8518 and not under CTH 8542 HC*.
- Bezrukova, N., Volochai, M., Hyrych, S., Ternova, A., & Vasylyshyna, O. (2024). The impact of globalisation on international trade: Dynamics of global trade relations and exchange of goods and services. In *Multidisciplinary Reviews* (Vol. 7, Issue Special Issue). Malque Publishing.
<https://doi.org/10.31893/multirev.2024spe042>
- Brigstock, P. C. (2017). *Problems of interpretation and application in tariff classification; some consequential customs compliance risks and mitigation*.
- Chen, S.-C. (2016). *In the name of legal certainty? Comparison of advance ruling systems for tariff classification in the European Union, China and Taiwan*.
- Colesky, T., & Franzsen, R. (2022). The adjudication of customs' tariff classification disputes in South Africa: lessons from Australia and Canada. *Asakura World History of the Customs and Tariffs*, 20(1). <http://www.wcoomd.org/en/about-us/legal->
- Davis, K., Drey, N., & Gould, D. (2009). What are scoping studies? A review of the nursing literature. *International Journal of Nursing Studies*, 46(10), 1386–1400.
<https://doi.org/https://doi.org/10.1016/j.ijnurstu.2009.02.010>
- Dominguez Prost, E. R., & Scattolo, G. (2024). Inspections in Customs: A Case Study of the Role of Tariff Dispersion on Red Lane Classification in Argentina. *World Customs Journal*, 18(1), 32–48. <https://doi.org/10.55596/001c.116521>
- Grainger, A. (2024). Customs Tariff Classification and the Use of Assistive Technologies. *World Customs Journal*, 18(1), 3–31. <https://doi.org/10.55596/001c.116525>
- Guilherme Moreno Caiado, J. (2012). *From Coordination to Collaboration: explaining international disputes over tariff classification*. 1, 95–108.
- Gutierrez-Bucheli, L., Reid, A., & Kidman, G. (2022). Scoping reviews: Their development and application in environmental and sustainable education research. *Environmental Education Research*, 28(5), 645–673. <https://doi.org/10.1080/13504622.2022.2047896>
- Kappler, H. (2011). *Reversing the trend: low cost and low risk methods for assuring proper duty payments*. 5.
- Karavayev, T., Mokrousova, O., Yazvinska, K., Zhaldak, M., & Tkachuk, V. (2023). EXPERT EXAMINATION OF LEATHER IN INTERNATIONAL TRADE: UKRAINIAN EXPERIENCE. *Leather and Footwear Journal*, 23(2), 93–106.
<https://doi.org/10.24264/lfj.23.2.3>
- Kim, J. *, Kim, & Soyeon. (2015). Customs Classification Disputes over IT Products and Implications for Global Trade. *Journal of Product Research*, 33(2), 93–103.

- Kuznetsova, O. A., & Gustova, D. S. (2021). Controversy about goods classification: The use of terms and their definitions according to FEACN of the CU. *IOP Conference Series: Earth and Environmental Science*, 854(1). <https://doi.org/10.1088/1755-1315/854/1/012034>
- Lee, E., Kim, S., Kim, S., Jung, S., Kim, H., & Cha, M. (2023). *Explainable Product Classification for Customs*. <https://doi.org/10.8080/1020220078265>
- Levac, D., Colquhoun, H., & O'Brien, K. K. (2010). Scoping studies: Advancing the methodology. *Implementation Science*, 5(1). <https://doi.org/10.1186/1748-5908-5-69>
- Liao, M., Huang, L., Zhang, J., Song, L., & Li, B. (2024). Enhanced HS Code Classification for Import and Export Goods via Multiscale Attention and ERNIE-BiLSTM. *Applied Sciences (Switzerland)*, 14(22). <https://doi.org/10.3390/app142210267>
- Munn, Z., Peters, M. D. J., Stern, C., Tufanaru, C., McArthur, A., & Aromataris, E. (2018). Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach. *BMC Medical Research Methodology*, 18(1). <https://doi.org/10.1186/s12874-018-0611-x>
- Neville, Jr., M. K. (2016). *Tariff Classification Use In Eo Nomine Tariff Terms*.
- Nugrahaeni, R., & Tjen, C. (2021). Perception Analysis Of The Harmonized System: A Case Study Of Tariff Disputes In Indonesia. *Jurnal Perspektif Bea Dan Cukai*, 144(2), 2021.
- O'Flaherty, J., & Phillips, C. (2015). The use of flipped classrooms in higher education: A scoping review. *The Internet and Higher Education*, 25, 85–95. <https://doi.org/https://doi.org/10.1016/j.iheduc.2015.02.002>
- Pollock, D., Evans, C., Menghao Jia, R., Alexander, L., Pieper, D., Brandão de Moraes, É., Peters, M. D. J., Tricco, A. C., Khalil, H., Godfrey, C. M., Saran, A., Campbell, F., & Munn, Z. (2024). “How-to”: scoping review? *Journal of Clinical Epidemiology*, 176. <https://doi.org/10.1016/j.jclinepi.2024.111572>
- Shakhnazarov, B. A. (2024). Legal Approaches in International Trade Compliance. *Kutafin Law Review*, 11(4), 761–787. <https://doi.org/10.17803/2713-0533.2024.4.30.761-787>
- Sharma, P., & Goyal, N. (2023). How to Write a Scoping Review? *International Journal of Advanced Medical and Health Research*, 10(1), 53–56. https://doi.org/10.4103/ijamr.ijamr_91_23
- Shumba, W. (2024). *The International Convention on the Harmonized Commodity Description and Coding System: Legal Pillar Behind the Harmonized System*. https://www.wto.org/english/thewto_e/thewto_e.htm
- Stehlíček, Š. (2017). *Customs Classification and reclassification of information technology products under the WTO law written by*.
- Wagner, O. (2023). The Connection Formula in Classifying Goods Under the Harmonized System (HS) Convention. *World Customs Journal*, 17(2), 59–78. <https://doi.org/10.55596/001c.88843>
- Weerth, C. (2017). *HS 2002–HS 2017: Notes of the tariff nomenclature and the additional notes of the EU revisited. II*.
- Weerth, C. (2018). *Advance rulings and binding pre-entry tariff classification according to Article 3 TFA: Situation 2018-still a long way to go. 12(2)*.
- WCO (2025), What is the Harmonized System? available at <https://www.wcoomd.org/en/topics/nomenclature/overview/what-is-the-harmonized%20system.aspx> (Accessed Aug/01/2025)