



Exploratory Study on the Growth Challenges for Medium-Sized Ports: A Practical Application of QCA in Examining the Links Between Seaborne Trade Imbalances and Expansion Opportunities

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ABSTRACT

The imbalance of seaborne trade poses significant challenges to medium-sized ports, creating an undesirable disequilibrium between import and export cargo flows. This imbalance can lead to various impacts that compromise port operational planning and development. However, the lack of comprehensive studies and inadequate attention to the specific nature of Malaysian medium-sized ports has left the potential impacts associated with trade imbalances largely unexplored, increasing the vulnerability of these ports. This study aims to address the gap by exploring the potential impacts arising from seaborne trade imbalances in medium-sized Malaysian ports. Through a systematic qualitative research framework and qualitative content analysis, the research captures insights from field experts and established literature to identify key themes and categories of impacts. The study highlights five primary areas impacted by trade imbalances: cargo handling, transport operations, port services and performance, port revenue and profits, and port planning and expansion. By providing empirical perspectives on the impacts encountered by Malaysian medium-sized ports, this research fills a significant void in current literature and contributes valuable information for decision- and policy-makers. The findings also reveal impacts that could affect broader port development potentials, ultimately guiding future research and policymaking to bolster port resilience and sustainability.

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1. Introduction.

This Maritime transportation plays a pivotal role in supporting international trade, with approximately 80% to 90% of global trade by volume transported by sea (Rodrigue, 2013; United Nations Business Action Hub, 2017; UNCTAD, 2017). This mode of transport is crucial for the movement of goods

and is expected to grow steadily in the coming years (United Nations Business Action Hub, 2017).

Despite a slowdown in global seaborne trade in 2018, trade imbalances between exports and imports in developing economies continued to grow, reaching a deficit of approximately -623 million tons for the year. Developing economies in Asia and Oceania accounted for most of the world's seaborne trade, with 4.3 billion tons loaded and 5.9 billion tons unloaded. This equates to about 1.6 billion tons more goods being unloaded than loaded (UNCTAD, 2019). Meanwhile, in 2022, the volume of global seaborne trade decreased by 0.4%, falling to 12,027 million tons from 12,072 million tons in 2021. Although this decline follows a significant rebound in 2021, it is much smaller compared to the steep drop seen in 2020 when the COVID-19 pandemic began. The 2022 results indicate a return to normal after the unexpected surge in the market in 2021 (UNCTAD, 2023).

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Malaysia, as part of the group of developing economies which located in Asia region, also has ports with significant negative trade imbalances, thus raising concerns about the potential impacts associated with seaborne trade imbalances for the medium-sized ports within the country. Medium-sized ports or also known as secondary ports, are important nodes in the national maritime logistics chain as they are the specialized maritime gateway of the states or region's sea-related economic activities and the secondary contributor to the country's maritime economy supporting the roles of country's primary ports (Othman et al., 2023). However, given the absence of existing studies on seaborne trade imbalances in Malaysian medium-sized ports, a preliminary study is required to look on these issues and provide insights into the potential impacts and their impact on port operations and businesses. This study is vital to ensure that medium-sized port operations can withstand the potential impacts and maintain competitiveness in meeting global trade demands.

For this paper, Section 1 has presented the introduction to the research background, Section 2 is devoted to explaining the Literature Review on the Application of QCA, the background of Medium sized ports in Malaysia, and the impacts of seaborne trade imbalance on maritime ports. Section 3 gives proper descriptions on the methodology applied in the study and Section 4 explains the results and discussions of the study. Finally, Section 5 presents the conclusions and recommendations for future studies.

2. Literature Review.

2.1. Theoretical Concept of Qualitative Content Analysis and its Applications.

Qualitative Content Analysis (QCA) has its origins in quantitative content analysis, which was initially developed in communication studies to analyze media content (Puppis, 2019). Over time, it evolved to incorporate qualitative methods, allowing for a more nuanced understanding of textual data. In its early development, QCA was grounded in a communication model that emphasized the importance of context in interpreting text (Mayring, 2015).

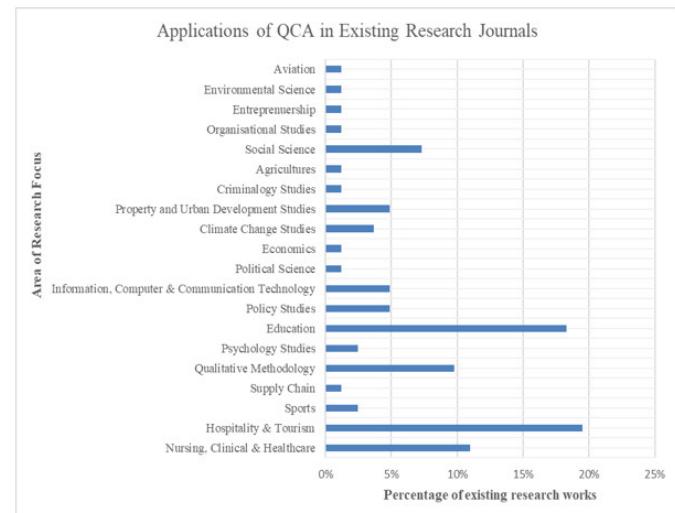
The qualitative aspect of QCA focuses on exploring complex phenomena through detailed, contextual descriptions of non-numerical data. It involves a rule-oriented process in which specific analytical rules guide the coding of text. QCA assumes that texts can be systematically analyzed to uncover underlying themes and patterns. Categories, central to the process, are developed either inductively (from the data) or deductively (based on existing theory). Pilot testing of categories and rules, along with checks for intra- and inter-coder reliability, ensures consistency throughout the analysis (Mayring, 2015).

Mayring (2015) also noted that QCA is highly flexible, making it adaptable to various research contexts and suitable for analyzing a wide range of textual data. While often compared with other qualitative methods such as Grounded Theory and Ethnography, QCA differs in focus. Grounded Theory aims to

generate theory from data, and Ethnography emphasizes narrating participants' experiences, thoughts, and feelings. In contrast, QCA is primarily concerned with systematically describing the content of texts during the interpretive process.

Figures 1 and 2 depict the extent to which Qualitative Comparative Analysis (QCA) is applied across various fields, as reported in research journals. The data was gathered through an extensive scoping review of the existing literature to provide an overview or map of the available research articles on QCA (Mun et al., 2018). Employing a scoping review approach on several article databases including SCOPUS, Web of Science and Google Scholar, the review process produced the following results: Total articles initially found and screened about 867 articles, based on keywords: Seaborne trades, Medium-sized ports, Malaysian ports, Qualitative Content Analysis (QCA), Qualitative Study. Meanwhile, articles selected for detailed screening were 149 articles, which screened based on the title and abstract review. The articles that were fully reviewed were left only 82 articles, after thorough quality assessment including set inclusion and exclusion criteria, which means the number of articles excluded were about 67 articles, due to failure to meet quality standards or relevance criteria. The inclusion criteria of this review approach focused on the Qualitative Content Analysis (QCA) articles, review articles, research articles, which published within year of 2004 until 2024. Articles were excluded if they featured out of scope articles, unclear QCA methodologies or low-quality articles. The scoping review matrix of QCA Applications in Various Sectors is summarized as in Appendix A.

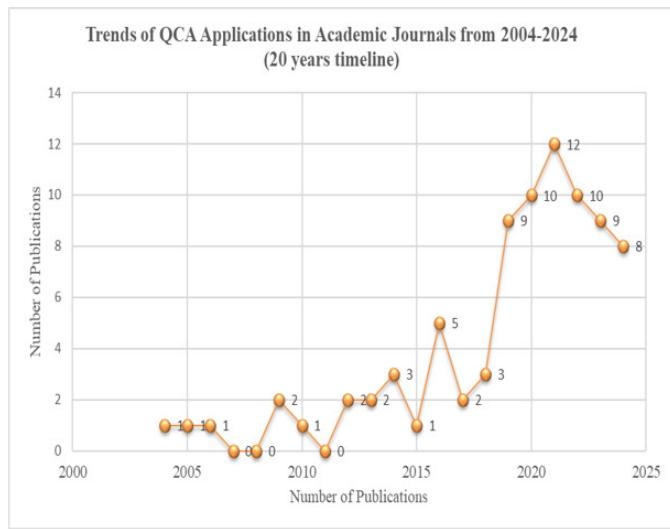
Figure 1: Application of QCA in Existing Global Research Journals.



Source: Authors.

The scoping review, as illustrated in Figure 1, reveals that Qualitative Content Analysis (QCA) is most prominently employed in Education, Hospitality and Tourism research, accounting for approximately 18% to 19% of all applications. This highlights its significance as a valuable analytical tool within

Figure 2: Trends of QCA Application in Academic Journals from 2004-2024.



Source: Authors.

this discipline. Further analysis indicates that fields dealing with complex social phenomena, such as Nursing, Clinical and Healthcare, Social Science and Qualitative Methodology studies, also exhibit notable engagement with QCA, with usage ranging from 7% to 11%. This trend underscores QCA's utility in unravelling intricate social systems and providing a clear understanding of multifaceted issues under investigation. Emerging interdisciplinary fields, including Property and Urban Development, Policy studies, Climate changes, Information, Computer & Communication Technology (ICCT), Psychology and Sports Studies, display a moderate adoption level of around 3% to 5%, likely due to the growing recognition of qualitative aspects influencing social development, behaviours, and urban development dynamics, especially when analysing complex and uncertain human-related conditions and their developmental impacts.

In contrast, more dynamic fields like Supply Chain, Agriculture, Criminology, Aviation, Environmental Science, Economics, Entrepreneurship, Political Science and Organisational studies show minimal integration of QCA methodologies, with representation below 3%. This limited use could be attributed to the reliance of these areas on quantitative methods, which are better suited for handling large datasets and producing statistically significant results, particularly when analysing constantly changing phenomena. For example, fields like Supply Chain and Economics frequently employ econometric models and statistical analyses to predict trends and optimize operations, which can vary over time. Additionally, the availability and quality of quantitative data in sectors like Supply Chain and Agriculture often make these methods more attractive. In contrast, QCA relies heavily on detailed qualitative data, which involves human expertise and judgments, data that may be less accessible or harder to standardize in these fields.

The findings from Figures 1 and 2 suggest a broader accep-

tance of QCA within the humanities and social sciences compared to natural sciences and globally dynamics-related fields. This disparity may stem from inherent differences in subject matter complexity or varying epistemological approaches to research across disciplines. In addition, one notable gap found in the dataset is the absence of QCA application in maritime studies, indicating that the method has not yet been widely adopted in this area although this method has its own advantage to capture valuable insights which difficult to understand from numerical perspective. Given the interdisciplinary and complex nature of maritime studies, QCA could offer valuable insights by enabling comparisons and analyses of different configurations of variables (Mayring, 2015). Therefore, this presents an opportunity for researchers to explore the potential of QCA in maritime context extensively.

From the review conducted, similarly to other dynamic fields, the limited integration of QCA in maritime research could be attributed to various factors including methodological preferences, the nature of research questions, established research traditions, data availability, and epistemological differences. Introducing QCA into maritime research could complement existing methods and provide new insights or alternative approaches for addressing complex, unclear investigative issues.

2.2. Roles of Medium Sized Ports in Malaysia.

Ports are critical infrastructure in global trade, facilitating the movement of goods and materials across international borders. In Malaysia, ports play a pivotal role in the nation's economic development, given its strategic location along major shipping routes in Southeast Asia (Somu et al., 2022). While much attention is often given to major ports such as Port Klang, the Port of Tanjung Pelepas and Penang Port (Jeevan, et al., 2015; Jeevan et al., 2021; Ahmad Fuad et al., 2023), the medium-sized ports also play essential roles in the national and regional economies (Abdul Rahman et al., 2018; Othman et al., 2023).

The history of Malaysian ports dates back to the ancient maritime trade routes of the Malay Archipelago, which were vital in the spice trade connecting the East and the West. The Malacca Sultanate, established in the 15th century, became a significant trading hub, leveraging its strategic location along the Malacca Strait. This tradition of maritime trade laid the foundation for modern port development in Malaysia. During the colonial period, the British established several key ports to facilitate the export of tin, rubber, and other commodities. Port Klang, formerly known as Port Swettenham, and Penang Port were among the earliest and most important ports during this time. The post-independence era saw the expansion and modernization of these ports, alongside the development of new ones to cater to the growing demands of international trade (Mohd Rusli, 2012; Department of Information Malaysia, 2016).

According to Othman et al., (2023), medium-sized ports in Malaysia have developed alongside their larger counterparts, playing a complementary role in the national port system. These ports typically handle specific types of cargo or serve regional markets, relieving congestion at major ports and providing more localized services. These medium-sized ports are integral to

Malaysia's economic framework for several reasons such as regional economic development, diversification of trade routes, specialization of trade products and job creation. These ports stimulate regional economies by providing essential infrastructure for trade and industry. For instance, the Port of Kemaman has spurred industrial growth in the east coast region, while Kuching Port and Sepanggar Bay Port support the maritime trade sector in Sarawak and Sabah, respectively. By offering alternative routes and capacities, medium-sized ports help diversify Malaysia's trade logistics from multiple regions. This reduces dependency on major ports and enhances the resilience of the national supply chain against disruptions. With specializations of many medium-sized ports in handling specific types of cargo, such as LNG and Petroleum products at Kertih Port or palm oil at Pasir Gudang Port, it allows for more efficient handling and processing of these commodities, adding value to Malaysia's export capabilities. Additionally, these ports also generate employment opportunities, both directly within the port operations and indirectly through related industries such as logistics, manufacturing, and services. The economic activities stimulated by these ports contribute to local livelihoods and community development.

Despite their significant contributions, medium-sized ports in Malaysia face several challenges related to infrastructure needs, competition, regulatory hurdles, and environmental concerns (Abdul Rahman et al., 2018; Othman et al., 2020; Azizan et al., 2023). Most of these ports require continuous investment to maintain and upgrade infrastructure to keep pace with technological advancements and increasing cargo volumes. However, limited financial resources often constrain efforts for continuous development, impacting port efficiency and competitiveness. Additionally, medium-sized ports frequently compete with larger, more established ports for cargo and investment, which can limit their market share and influence in the maritime industry. Navigating complex regulatory environments and administrative procedures creates further challenges for port operations. Without proper streamlining of these processes, it is difficult to improve port efficiency and attract more business (Othman et al., 2020; Azizan et al., 2023). Environmental concerns and sustainability also pose significant challenges for medium-sized ports. According to the United States Environmental Protection Agency (2023), port operations can have significant environmental impacts, including pollution and habitat disruption. Implementing sustainable practices and mitigating environmental damage requires substantial commitments from stakeholders, including financial investments and clear policies for the long-term viability of these ports.

Despite facing challenges in the forms of infrastructure needs, competition, regulatory hurdles, and environmental concerns, the medium-sized ports have a crucial role to play in the nation's maritime landscape and significant growth potential in supporting regional economic development. With proper government policies and initiatives, along with technological advancements and regional trade opportunities, medium-sized ports can further enhance their contribution to Malaysia's economy through maritime trade and strengthen the country's position in the global maritime industry.

2.3. Impacts of seaborne trade imbalances on maritime ports.

With regard to seaborne trade imbalances, the asymmetry in cargo flows between imports and exports not only creates issues for carriers and shipping service providers but also poses various impacts to maritime ports. Angbo (2008), Ng (2012), and UNCTAD (2015) all highlighted the complications arising from seaborne trade imbalances. Notteboom (2018) shared a similar view, stating that these imbalances can present significant challenges for ports, as they need to manage disequilibrium in cargo flows and navigate the impacts it creates. An irregular or pronounced imbalance can be a major contributor to systemic impacts, leading to unfavorable impacts on various organizations (Blanchard and Milesi-Ferretti, 2009; 2011; Marchetti et al., 2012), including ports closely linked to seaborne trade activities and the shipping industry.

Rodrigue (2017) noted that seaborne trade imbalances could lead to increased accumulation of empty containers and unloaded cargoes at ports, compromising operational efficiency. Additionally, these imbalances can result in reduced port capacity for handling incoming cargoes (Karmelić et al., 2012; Ng, 2012; Ramphul et al., 2017), increased local repositioning of empty containers (Rodrigue, 2017), and limited port handling equipment due to the rising volume of repositioning activities amid constrained port capacity.

However, the effects of seaborne trade imbalances are not confined to port handling capacity alone. Angbo (2008) associated trade imbalances with the impact of port congestion. The United Nations Conference on Trade and Development (UNCTAD) emphasized that imbalances in physical trade flows could lead to congestion and diseconomies of scale within ports (UNCTAD, 2015; 2023). This point was underscored by cases like that of Yangon Port in Myanmar, where trade flow imbalances contributed to significant port congestion (Mooney, 2016a; 2016b).

Despite these insights, there has been a lack of in-depth studies examining all the impacts generated by seaborne trade imbalances on medium-sized port operations worldwide, particularly from a port industry perspective. This gap has left the actual impacts facing the medium-sized port sector uncertain and lacking empirical evidence. In Malaysia, similar gap was also found in the country's medium-sized port operations due to limited comprehensive studies and insufficient attention given to seaborne trade imbalances. This uncertainty necessitates further research to identify and assess these impacts, allowing port stakeholders to either avoid them or reduce their impact. Therefore, an exploratory study is needed to explore the potential impacts could be generated by seaborne trade imbalances on medium-sized port operations specifically since ports are heterogenous in term of their background and operational functions.

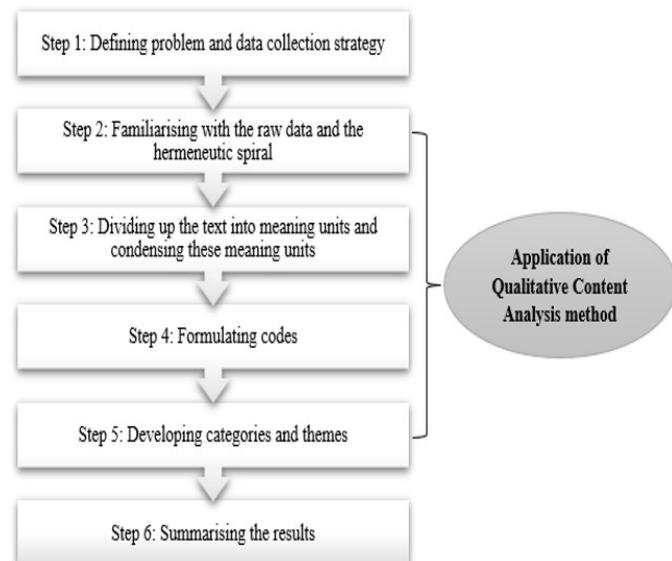
3. Methodology.

In this exploratory study, the views of the selected and well-experienced field experts were gathered qualitatively to identify any unusual impacts or threats that may be induced by seaborne

trade imbalance conditions against the medium sized ports particularly in Malaysia, which not yet be emphasized in existing literatures. The qualitative content analysis (QCA) method has been applied in the analysis part of this study to analyse the qualitative data collected from the interviews. Using the qualitative content analysis, it involves the process of interpreting textual data to uncover themes, patterns, or insights (Polit and Beck, 2006; Bengtsson, 2016). This approach enables this study to systematically and analytically examine textual or visual content to extract meaning, identify patterns, themes, or categories, and understand the underlying concepts or phenomena (Bengtsson, 2016; Erlingsson and Brysiewicz, 2017). The specific qualitative research framework designed for this study are provided in Section 3.1.

3.1. Qualitative Research Framework with the Application of Qualitative Content Analysis Method.

Figure 3: Systematic process of qualitative research framework.



Source: Adopted QCA steps from: Erlingsson and Brysiewicz (2017).

By referring to Figure 3, the detailed explanations on the systematic process of qualitative research conducted in this study are described as in the following steps:

3.1.1. Step 1 - Defining problem and data collection strategy..

Limited empirical evidence and insufficient attention given to the issue of seaborne trade imbalances in medium-sized port operations were found, including in Malaysia. Hence, the impacts of seaborne trade imbalances on the medium-sized ports in Malaysia are still uncertain and underexplored. Therefore, a qualitative approach was adopted in this study to gather multiple perspectives on the operation of medium sized ports under investigation. The approach involves conducting a critical review of global literatures and semi-structured interviews with local field experts to explore the associated impacts of seaborne

trade imbalances on the targeted ports. In identifying the impacts clearly, the qualitative data obtained from the reviews of global literature were incorporated to analyse the experts' viewpoints and enhance the findings of this study.

By using the expert sampling technique, a number of three distinguished field experts have been selected for the interview sessions. The field experts selected came with highly experienced backgrounds which related to medium sized ports industry that consist of two senior port operations managers, and one senior executive of port quality assurance. They have been involved in planning, managing or coordinating the operations of several medium sized ports in Malaysia, respectively, as well as monitoring the quality assurance across the port operation, services, management and development systems based on the official operating standards. Their backgrounds matched with the criteria set in the selection of qualified respondents, which are more than five years of experiences in port operations and have well-defined knowledge on medium-sized ports sector in Malaysia.

3.1.2. Step 2 - Applying QCA for familiarizing with the data and the hermeneutic spiral.

This qualitative content analysis (QCA) was applied in this research to familiarize oneself with the raw data, properly, in which this involves the process of reading the transcribed interviews obtained from the port experts' perspectives, repeatedly, with a clear focus on the research objective and question. The initial reactions and impressions on the texts has been noted or highlighted properly as it will help to capture and engage with the related contents that link to the scope of inquiry, which in this study was referring to "What are the potential impacts associated with the seaborne trade imbalance against the expansion opportunity of medium-sized ports in Malaysia?". This iterative process, known as the hermeneutic spiral or hermeneutic circle, has also been involved to compare individual components of data with the broader context including global literatures to ensure that the sense of the whole informs the interpretation of the parts, and vice versa (Erlingsson and Brysiewicz, 2017). This constant interplay between the whole and the parts is crucial throughout the analysis, ensuring that each section is consistent with the overall understandings of the contents. Table 1 demonstrates how transcribed texts were familiarized.

3.1.3. Step 3 - Dividing up the text into meaning units and condensing these meaning units.

After reading the transcribed interview texts several times, with the research aim and question determined, the next step is to break the text into meaning units. A meaning unit is a segment of the text that holds a distinct idea or concept (Erlingsson and Brysiewicz, 2017). Once the meaning units have been identified, they are condensed into relevant sentences or contexts while ensuring the core message remains intact. Condensation of meaning units involves creating a shorter version of the original texts while preserving its essential meaning. In some cases, a meaning unit may be concise enough that further condensation is not necessary. However, it should be noted that overly condensed meaning units can lead to fragmentation,

Table 1: Transcribed texts and identified points from the interviews.

| Transcribed and scrutinized texts: | Identified points |
|---|--|
| <i>Transcribed texts 1:</i> Seaborne trade imbalances significantly challenge medium-sized ports in terms of capacity management and operational efficiency. For example, they can cause empty containers accumulate in the port area if not properly managed. This accumulation of empty containers in port areas which due to the imbalanced trade flows can lead to space constraints, hindering optimal cargo handling operations. This also limits the port's ability to handle increasing cargo volumes and maintain efficient operations. | Empty containers accumulate in port area. Space constraints |
| <i>Transcribed texts 2:</i> Accumulating empty containers occupies valuable space that could otherwise be used for loaded cargo or other operational needs. This causes congestion within the port and creates bottlenecks in cargo handling processes. Moreover, repositioning these empty containers outside the port area creates additional logistics challenges, such as managing empty container flows and the associated costs. | Empty containers are repositioned outside port area. Create empty container flow. |

Source: Authors.

which can cause the study to lose the key information needed. Table 2 demonstrates the transformation process of identified points from the interviews to condensed meaning units.

Table 2: Transformation of identified points from the interviews to condensed meaning units.

| Identified points | Meaning units | Condensed meaning units |
|--|---|---|
| Empty containers accumulate in port area. | | |
| Empty containers can cause space constraints | Empty containers are piling up within the port. | Empty containers occupy space in the port. |
| Imbalance of cargoes flows cause limited spaces at port. | Accumulation of cargo and containers limits available space. | Limited port space due to cargo accumulation. |
| Empty containers are repositioned outside port area | Empty containers are moved out of the port to manage space constraints. | Containers moved out to free up space. |
| Create empty container flow. | Repositioning containers generates logistical flows of empty units | Movement of empty containers creates flow. |

Source: Authors.

3.1.4. Step 4 - Formulating codes.

The following step of QCA involves creating codes, which are descriptive labels for the condensed meaning units. The codes created should succinctly represent the essence of the condensed meaning units and serving as a tool to help researchers explore the data in fresh ways (Hsieh and Shannon, 2005). By applying the coding system, it is easier to identify links between different meaning units. At this stage, focus should be given directly on the data itself with minimal interpretation to avoid confusion.

To ensure effective and efficient flow of coding process, it is important to remain flexible throughout this step. The initial codes can be adjusted, re-do, re-think, and re-code in order to refine the understandings of data, if necessary and suitable,

while making sure that the new or final codes remain align with the meanings of data (Erlingsson and Brysiewicz, 2017). The global literatures that related to the scope of this study are also referred to support the coding process. Similar to the initial phase of familiarizing with the data, it is useful to write important notes about the impressions and reactions while coding as this practice will allow to track the thought process and provide additional insights during later stages of analysis.

3.1.5. Step 5 - Developing categories and themes.

In this step, the codes should be sorted into categories which can address questions like who, what, when, or where. To create meaningful categories, comparison on the codes should be done to identify which ones seem to fit together and able to be combine in form of a cohesive group. Essentially, a category is made up of codes that focus on the same aspect or represent similar concepts, which referred to as manifest content in the data with minimal interpretation by the researcher. Category names are typically concise and straightforward (Erlingsson and Brysiewicz, 2017).

Nevertheless, when dealing with data rich in deeper, underlying meaning, the analysis can be further up to create themes. Themes represent deeper layers of meaning, known as latent content, and are formed by combining two or more related categories. They address questions like why, how, in what way, or by what means. Hence, theme names often include verbs, adverbs, or adjectives, and they can be either more descriptive or even poetic (Erlingsson and Brysiewicz, 2017).

3.1.6. Step 6 - Summarising the results.

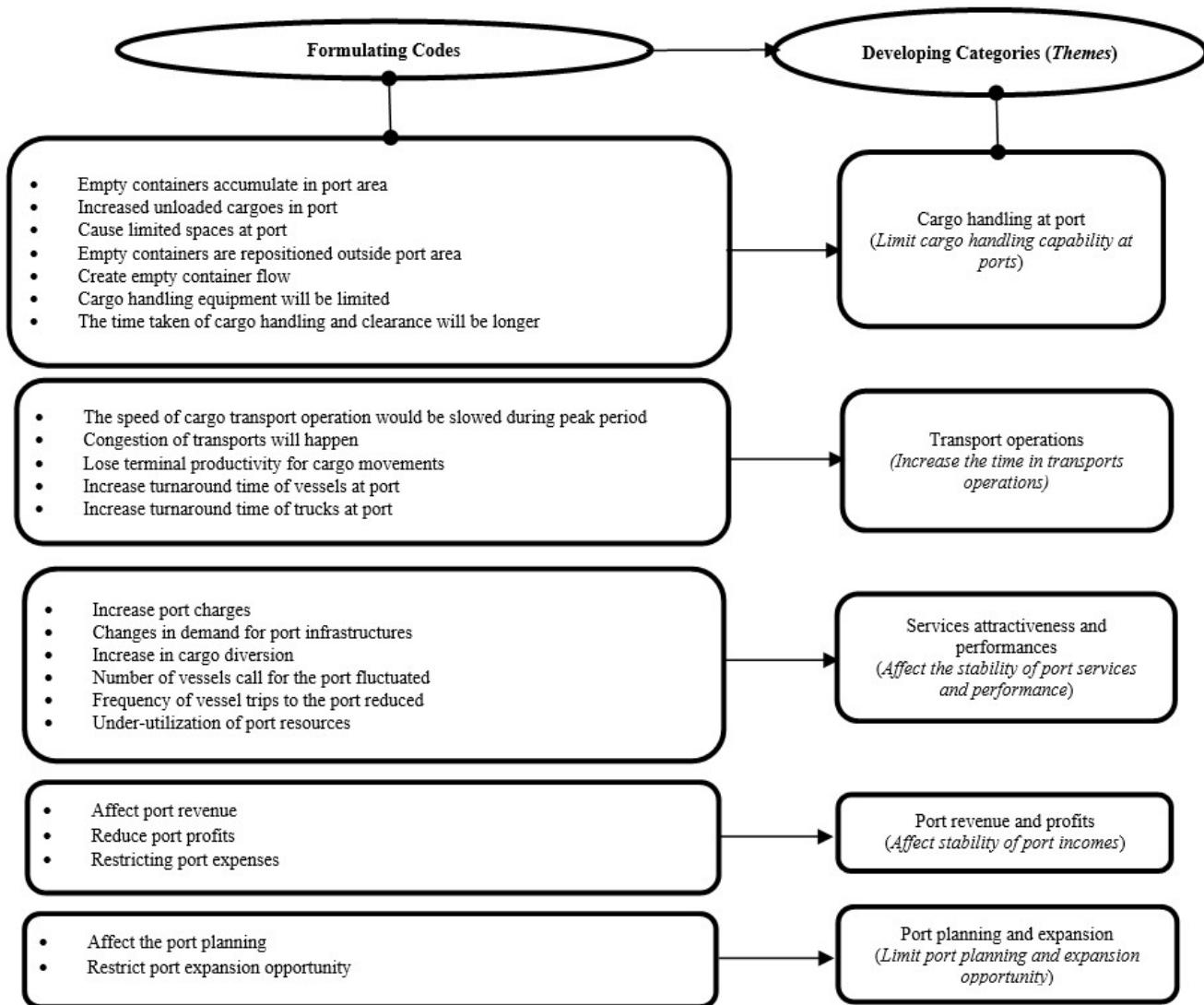
Based on the analysis of data from interviews, five key themes and categories have been identified in relation to the impacts associated with seaborne trade imbalances at Malaysian medium sized ports. The summary of codes, category and main themes established related to the potential impacts of seaborne trade imbalances on the expansion opportunity of medium sized ports are shown in Figure 4 (See Section 4: Results and Discussions).

4. Results and Discussions.

As depicted in Figure 4, the port experts have highlighted that significant imbalance in seaborne trade could gradually impact medium sized ports development in Malaysia. These impacts affect several areas, including 1) cargo handling at ports, 2) transport operations, 3) service attractiveness and performance, 4) port revenue and profits, and 5) port planning and expansion.

Concerning cargo handling aspect, the experts shared that significant seaborne trade imbalances can disrupt cargo handling activities when excess empty containers accumulate within the port area, requiring additional repositioning outside the port and leading to an increased flow of empty containers. This situation limits the availability of cargo handling equipment, subsequently delaying cargo clearance and increasing the accumulation of unloaded cargoes within the port.

Figure 4: The summary of codes, category and main themes established related to the potential impacts of seaborne trade imbalances on the planning and growth of medium sized ports.



Source: Authors.

In terms of transport operations, experts described the disruptions in port handling capacity can lead to slower cargo transport operations, especially during peak periods, causing congestion within the port area. This congestion affects terminal productivity as it increases turnaround times for vessels and trucks at the port.

Regarding port service attractiveness and performance, experts noted that when seaborne trade imbalances become significant, accompanied by various operational impacts, the stability of port services and performance is gradually impacted. This manifests in various ways, such as changes in port charges, inconsistent demand for port infrastructure, increased cargo diversion to other ports, fluctuations in the number of vessel calls, reduced frequency of vessel trips, and underutilization of port resources. However, these impacts can vary depending on the specific port's capabilities to manage and mitigate them at the early stages.

Referring to port revenue and profits, experts acknowledged that significant seaborne trade imbalances could influence these financial aspects due to the operational impacts involved. The data analysis indicated that port revenue, profits, and expenses could be adversely affected. Although these issues can pose impacts to overall port revenue and profits on an annual basis, one expert noted that this information is rarely made public to protect port stakeholders' interests.

Lastly, on port planning and expansion, experts were on the opinions that significant seaborne trade imbalances might restrict port operational planning and expansion opportunities. This is because inconsistent import and export flows lead to suboptimal utilization of existing port facilities and services, creating challenges in executing expansion plans or operational enhancements.

If planning continues under such conditions, port facilities could become over-supplied, negating the benefits of expand-

sion. Hence, it may not be worth investing to have an unsustainable port expansion or an expensive and sophisticated operating system upgrade, which may be underutilized in the long run.

Therefore, port authorities, operators and planners must carefully evaluate the long-term feasibility of any expansion initiatives within the context of fluctuating trade flows. It is because sustainable growth in port infrastructure requires a balanced approach that aligns with proper demand projections, ensuring that any expansion or technological upgrade enhances operational efficiency as well as productivity without risking underutilization. In this way, ports can avoid costly investments that may compromise financial stability and fail to deliver enduring value.

Conclusions.

In conclusion, this study has successfully met its objective of investigating the impacts arising from seaborne trade imbalances at Malaysian medium-sized ports using an empirical qualitative approach. By identifying five key themes and categories, the research has shed light on the various impacts associated with seaborne trade imbalances, impacting aspects such as cargo handling, transport operations, port services and performance, port revenue and profits, and port planning and expansion.

The paper contributes to filling a significant gap in the literature by providing empirical evidence on the impacts faced by Malaysian medium-sized ports due to seaborne trade imbalances. These findings address an area that has received limited attention in global literature and among policymakers. Additionally, this study offers fresh insights into previously underexplored impacts, such as the cascading effects of empty container accumulation, disrupted port operations, and reduced service attractiveness. The application of Qualitative Content Analysis (QCA) in this research provides a structured and systematic approach to exploring the complex impacts of seaborne trade imbalances on medium-sized Malaysian ports. By employing QCA, the study was able to extract, categorize, and analyze nuanced insights from expert interviews and existing literature, allowing for the identification of key impact areas across various dimensions of port operations and performance. The use of QCA ensured consistency and rigor, offering a replicable framework that can be applied to similar studies within maritime and port research.

These findings not only deepen the understanding of the unique challenges facing medium-sized ports in Malaysia but also underscore the need for further research to comprehensively assess these ports. A more focused approach could help identify strategies to mitigate impacts, enhance port capabilities, and boost the contributions of these ports to local and national economies. Addressing these impacts and challenges is crucial to ensuring the sustainable growth and development of medium-sized ports, ultimately supporting broader seaborne trade stability and resilience. Future studies can use the findings or methodology of this research as ground-breaking platform to explore deeper into the seaborne trade imbalance issues from

other relevant perspectives. Such studies will make a significant contribution to the body of knowledge related to the maritime industry and maritime trades.

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