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Mpuon Joseph Akam, Eze Felix John, Odigbo Benedict Ejikeme, Joseph A. Anyadighibe, Eyo Itam Eyo, Enuoh Rebecca Oliver, Samuel Etim Ndem

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## **The role of strategic alliances in logistics performance of container shipping and transport firms**

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Mpuon Joseph Akam\*, Eze Felix John,  
Odigbo Benedict Ejikeme and  
Joseph A. Anyadighibe

Department of Marketing,  
University of Calabar, Nigeria  
Email: Mpuonjoseph@unical.edu.ng  
Email: mpuonjoseph@gmail.com  
Email: ezefelixjohn@unical.edu.ng  
Email: ben.odigbo@unical.edu.ng  
Email: janyadighibe@unical.edu.ng  
\*Corresponding author

**Eyo Itam Eyo**

Department of Banking and Finance,  
University of Calabar, Nigeria  
Email: eyoakamba@unical.edu.ng

**Enuoh Rebecca Oliver**

Department of Business Management,  
University of Calabar, Nigeria  
Email: roenuoh@unical.edu.ng

**Samuel Etim Ndem**

Department of Marketing,  
University of Calabar, Nigeria  
Email: nollinsam@unical.edu.ng

**Abstract:** This research work investigates how collaborative and cooperative strategic partnerships in container shipping correlate with transportation enterprises' logistical performance. Strategic collaborative and cooperative alliances have been argued empirically and theoretically that they reduce the scenario in which the industry's stronger members negotiate all advantages plus some weaker members' partnership earnings, encouraging veracity, commitment, flexibility, trust, honesty, integrity, confidence, and weakening the partnership's ultimate breakup. Yet, there appears to be no empirical research on collaborative and cooperative strategic alliances in the logistics performance of container shipping and transport firms, particularly in terms of

strategic collaborative and cooperative alliances that improve firms' effectiveness and efficiency. Based on this limitation, the researchers sought to bridge the knowledge gap in this study. In the course of the study, 505 questionnaire copies were given to registered management employees of 101 container shipping and transport enterprises in Nigeria. Four hundred thirty-four was completed and found useful for inclusion.

**Keywords:** collaborative and cooperative alliances; container shipping; logistics performance; resource-based view theory; resource dependency theory; strategic alliance; transportation.

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**Biographical notes:** Mpuon Joseph Akam is a Lecturer in the Department of Marketing, University of Calabar, Nigeria. His research interest is mainly in the areas of supply chain management, marketing logistics, purchasing and supply, distribution management and industrial marketing. He has published both in national and international reputable journals.

Eze Felix John is a Lecturer in the Department of Marketing, University of Calabar. He has been the Head of Marketing Department and he is currently the sub-Dean at the Faculty of Management Sciences, University of Calabar. He has published in reputable journals both locally and international.

Odigbo Benedict Ejikeme is currently a Lecturer in the University of Calabar, and also a well-known research consultant within the academic cycles.

Joseph A. Anyadighibe is a Lecturer in the Department of Marketing, University of Calabar, Calabar, Nigeria. His areas of specialisation are service marketing, retails/sales management and product and brand management. He has published many articles in national and international journals.

Eyo Itam Eyo is a Lecturer in the Department of Banking and Finance. His research interest spans corporate finance, entrepreneurship and monetary policy.

Enuoh Rebecca Oliver is a Lecturer in the Department of Business Management, University of Calabar, Nigeria. She is currently the Head of Department in Business Management. She has published over 30 articles in local and international journals.

Samuel Etim Ndem is a Lecturer in the Department of Marketing, University of Calabar. He is an educator, researcher and a social entrepreneur with keen interest international marketing, relationship marketing and strategic marketing as well as supply chain management and logistic.

## 1 Introduction

The pattern of international shipping has been drastically altered by containerisation. Container terminals, which are means that connect other modes of transportation to assist

the flow of commodities from the manufacturing to the consumption ends of the supply chain, have seen substantial expansion with the advent of container boxes for managing the conveyance of goods globally (Wong et al., 2012). This study took another step towards evaluating the crucial impact of collaborative and cooperative strategic alliances on the logistics performance of container shipping and transport firms. Lun et al. (2010) argued that firms buy input in the factor market, selling value-added products to consumers in the firm's market, and participating in the financial transactions along and throughout the value chain requiring collaborative and cooperative efforts from members, particularly those in container shipping and transportation alliances. The contribution of these value-adding and exchange tasks, in addition to alliance partners' collaborative and cooperative efforts, determine the logistics efficiency and effectiveness of container shipping and transport enterprises (Lun and Brown, 2009; Lun et al., 2010; Lun and Marlow, 2011; Yeo, 2013). The role of global container shipping and transportation firms is constantly changing. Companies' intermodal international capabilities are now reliant on their capacity to successfully and efficiently manufacture and deliver bespoke transportation goods and services throughout the world (Elena and Yulia, 2021; Cyrus, 2020; Kim, 2017; Kykyri et al., 2019).

Strategic alliances are agreements between companies to collaborate and cooperate in the pursuit of mutually beneficial objectives and goals while remaining independent organisations (Chiu and Wang, 2019; Yap, 2018; Notteboom et al., 2017). Global strategic alliance can be reached in this modern era by forming new strategic alliances that embrace the mechanism of collaborative and cooperative logistics techniques that are both successful and efficient in the container shipping and transport companies (Hanane et al., 2021; Slack et al., 2002; Elmaz et al., 2018). Collaborative strategic alliances emphasise flexibility in a high-risk environment, while cooperative strategic alliances emphasise the need for veracity and commitment (Cairou and Guillotreau, 2021; Merk and Teodoro, 2022; Chalermpong, 2020; Chiu and Wang, 2019). This new strategic alliance paradigm appears to be desired for improving mutual forbearance, since too often, alliance partners get stuck in infighting (Sirimanne et al., 2019; Das and Bing-Shang, 2009; Cheung et al., 2020; Zhou and Kim, 2020).

Collaborative and cooperative strategic alliances play a critical part in container shipping service quality and transport firm innovations in terms of technological transfer, access to new knowledge and expertise, economic specialisation and risk-sharing to enable alliance partners to achieve their collective objectives (Chalermpong, 2020; Laem, 2019; Hall and Hao, 2019; Rau and Spinter, 2017). Scholars argued that the pivotal effect of strategic partnerships in container shipping and transportation firms is also justified by the logistics efficacy of the companies regarding their structure, operational efficiency, positioning activities and process, identifying the participants' responsibilities and clout, and the most effective ways for members of the group to collaborate and cooperate in the transportation delivery chain (Caschili et al., 2014; Midoro and Pito, 2000; Luo et al., 2009; Lu et al., 2006). Prior empirical and theoretical studies (Cheung et al., 2000; Corrine, 2013; Merk, 2018a, 2018b; Ma et al., 2020; Tran and Haasis, 2015; Gibbs et al., 2014) revealed that proper understanding of the new paradigm of strategic alliances that will incorporate the uniqueness of collaborative and cooperative strategic alliances correlating with logistical approaches of container shipping and transport firms is sacrosanct to performance improvement of alliance partners' efficiency and effectiveness in terms of profit maximisation, vessels' planning, capital investment, increase in customer service, financial risk reduction, higher shipping frequency, entrance into new

markets, economies of scale, container utilisation, repositioning and recycling, satisfying shippers requirements and a greater variety of routes and destinations.

Even though industry analysts consider alliances between companies to be extremely effective, Panayides and Gong (2002) argued that alliances could have two opposing effects on consolidation: they may have aided in increasing quantity of container shipping; on the other hand, alliance cooperation may limit the incentives for acquisitions and mergers. Furthermore, the Organization for Economic Cooperation and Development (OECD, 2018) declared that global alliances limit risk diversification opportunities and have aided in the merger of carriers and terminal operators, vertically to some extent. Similarly, SeaIntel (2018) argued that alliances make risk diversification more difficult for shippers. OECD (2018) maintained that shippers too often have traditionally dispersed cargo over multiple carriers to reduce risk, as a result of poor logistics performance in container shipping and transport firms. Furthermore, Kammlott and Schiereck (2011) affirmed that the inefficiency and ineffectiveness of logistical services in the container shipping and transport firms have so restricted the opportunities for risk diversification in alliances. OECD (2018) claimed that shippers are now aware of these alliance deficiencies in logistics performance of container shipping and transport firms which they have to employ back-up carriers for those outside of the alliance, although the options are limited. In the view of some commentators, inadequate logistical efficiency and effectiveness, lack of visibility in the container shipping and transport firm's supply chain is hindering efforts to diversify risk (Drewry, 2018; Danielis et al., 2005; Matheus et al., 2021; Sohail et al., 2009; Hiren, 2017). According to other studies, the lack of openness about which alliance logistical packages are provided directly by carriers, either as a lone worker or via a vessel, is attributed to lack of collaborative and cooperative strategic alliances (Das, 2011; Slack et al., 2002; Wong et al., 2018; Zheng et al., 2017). Global alliances, according to Maloni et al. (2016), minimise the potential for uniqueness among alliances on essential services such as transit time, on-time sailing, and vessel capacity availability, which are all covered by fleet pooling and are equivalent throughout alliances.

Besides, the services of container shipping companies have changed, according to Murnane et al. (2016), thus becoming less flexible and customer-oriented. In the submission of experts, strategic alliances that are not collaborative and cooperative in nature have boosted container shipping logistical inconsistency, an argument that has been emphasised for over a decade (SeaIntel, 2018; OECD, 2018; Drewry, 2018; Slack et al., 2002). Authors noted further that carriers whose ally have opposing strategies when it comes to logistics service qualities make it difficult to have a shared logistics service reliability. SeaIntel (2018) maintained that non-alliance carriers consistently outperform alliance carriers on all trade routes. The author argued that shippers who value reliability highly will dictate these characteristics within non-alliance carriers only, who are not engaged in the applicable trade channel. The author likewise noted that low-cost independent carriers may be more suitable to shippers driven only by price and unconcerned with reliability, efficiency and effectiveness in logistics service delivery. Meanwhile, it is upheld that global alliances, also known as strategic alliances are yet to have a positive impact on container carriers' schedule reliability, which ranged from 71% to 81% in 2017, a considerable drop from the 82% to 85% achieved in 2016 (SeaIntel, 2018; Yap, 2010; Stopford, 2008; Elena and Yulia, 2021). OECD (2018) said that since April 2017, a new constellation of alliances has been in place, coupled with the launch of mega-ships to which alliances are inextricably linked, leading to reduced service rates,

and lesser port ties, worse schedule dependability, and long queues. In the assertion of some authors, independent carriers may distinguish their logistical service standards and, as a result, provide more benefits to shippers and customers (Drewry, 2018; SeaIntel, 2018; OECD, 2018; Maloni et al., 2016). In addition, although all major carriers are members of coalitions, alterations in one alliance influence the whole industry (Charlampowcz, 2018; Mohammad et al., 2022; Cairou and Guillotreau, 2021). It is believed that the overall effects of partnerships on the containerised transportation system appear to be overwhelmingly unfavourable (Balci et al., 2018; Das and Bing-Shang, 2009; Panayides and Lun, 2009). The proponents of this position argued that, in conjunction with other difficulties, including mega-ships and port authority behaviour, some of which are directly tied to alliances, they contribute to port network concentration and consequent underutilisation of public assets. Given these, Munim and Schramm (2018), Borch and Henk (2018) and Jacobsson et al. (2018) asserted that the buying power of alliances inside ports can lead to destructive competition between terminal operators and other port service suppliers.

Other authors also maintained that the intriguing issue in strategic alliances is how alliance partners might gain enough confidence in partner collaboration and cooperation to avoid being overpowered by possible threat (Elnaz et al., 2018; Yap, 2010; Das and Teng, 2001b; Slack et al., 2002). Nevertheless, some argued that the relative likelihood of alliance failure in container shipping and transport firms is generally attributed to a lack of cooperation, collaboration and opportunistic behaviour of partners, given that it is sometimes impossible to predict who will act unscrupulously (Das, 2011; Angeloudis et al., 2015; Bowerso, 1990). Meanwhile, it is noted that a low level of confidence not only deters the creation of strategic alliances but they also cause partners to be distrustful of one another, which has obvious negative consequences for their working relationship (Yuen and Thai, 2017; Murnane et al., 2016; Sjostrom, 2010; Das and Bin-Shang, 2009). However, as argued by some, collaborative and cooperative strategic alliance as an important idea in the realm of strategic alliances that is leading to the notion of trust, commitment, honesty, flexibility, and adaptability, that will enhance container shipping and transport firms' logistics performance, have not been given due recognition by scholars (Chalermpong, 2020; Mohammad et al., 2022; Merk and Teodoro, 2022; Hanane et al., 2021; Chiu and Wang, 2019). Our goal in this current study is in line with Chalermpong (2020), Charlampowcz (2018), Lai et al. (2008), Elena and Yulia (2021), Caschili et al. (2014), Chiu and Wang (2019), Hanane et al. (2021), and Cyrus (2020), which is to go over the issues of strategic alliances as raised above, to see how they relate to container shipping and transport firms' logistics efficiency and effectiveness.

Veracity, commitment, trust and flexibility are defined as a company's perceived degree of confidence in alliance partners' interests in seeking mutually beneficial partnership objectives rather than acting opportunistically. We claimed that collaborative and cooperative strategic alliances that strengthen control mechanisms will enable alliance carriers and shippers to generate a sense of confidence, trust, commitment, honesty, flexibility and adaptability among partners. This research also aims to establish and explain research hypotheses as well as the justification for suggesting collaborative and cooperative strategic alliances as dimensions of global alliances that can increase the efficacy and efficiency of container shipping and transport firms' productivity. This study has contributed in expanding the scope of strategic alliances by proposing two dimensions of global alliances and connecting them to logistics performance of container shipping and transport firms. The following is a breakdown of the article's structure: the

next section analyses the literature as a theoretical foundation for developing research hypotheses and the study's conceptual framework. After that, follows the methodology, data presentation, data analysis, results and discussion.

## **2 Literature review and hypotheses development**

Global alliances in container shipping and transportation firms also known as strategic alliances are cooperative and collaborative agreements between shipping and transportation companies that operate on major global routes using ships, containers, and shared terminals (Lai et al., 2008; Chiu and Wang, 2019). Strategic alliances are inter-firms' collaborative and cooperative efforts with the goal of attaining the partners' strategic objectives (Stank et al., 2001; Frankel et al., 2002; Das and Bin-Shang, 2009; Hanane et al., 2021; Das and Teng, 2001b). A strategic alliance can take many forms, including joint ventures, minority equity stakes, co-production, joint research and development (Wibisono and Jittamai, 2015; Cyrus, 2020; Das, 2011). According to Brooks and Ritchie (2006), Bang et al. (2012), and Chiu and Wang (2019), strategic alliances in container shipping and transport firms entail coordinating more than two partners to attend to mutual goals. Effective collaboration and cooperation are necessary to enhance the firms' logistics performance. Collaborative and cooperative alliances are critical components of shipping and transportation companies' corporate strategy, because they increase the efficiency and effectiveness of logistical processes, resulting in the economics of scale in the industry (Cheung et al., 2020; Sirimanne et al., 2019; Yap, 2018; Wang et al., 2016). Strategic alliances that are collaborative and cooperative in nature encourages logistics performance in container shipping and transport firms through the acquisition of new and larger ships as well as the sharing of vessels to ensure higher utilisation rates and cost-saving (Varbanova, 2017; Tongzon, 2009; Davis et al., 2003). Collaborative and cooperative strategic alliances in container shipping and transport firms according to Asgari et al. (2013), Kim (2017) and Corrine (2013) enable alliance partners in the container shipping and transportation firms to improve their logistics performance by providing full global tailored transport products and services to customers. Stopford (2009) maintained that collaboration and cooperation strategies in alliances assist container shipping and transportation corporations to create shipping networks that allow them to share non-market and pricing rated expertise and facts. In the opinion of Kykyri et al. (2019), Hanane et al. (2021), Wang et al. (2014, 2015), shipping and transportation is a fascinating industry that necessitates excellent logistics performance in the transfer of goods at the forefront of global development.

Introducing collaborative and cooperative alliances in container shipping and freight strategic partnership would lead firms to efficiency and effectiveness in logistics performance by improving alliance partners' relationship with their customers in terms of communications and information sharing (Zheng et al., 2017; Ma et al., 2020; Lu et al., 2006; Zhau and Kim, 2020). Panayides and Wiedmer (2011) argued that collaborative and cooperative strategic alliances in container shipping and transportation firms will facilitate innovations in partners' logistics activities by integrating fragmented customer services and information sharing that enable partners in the shipping and transportation industry to be aware of the activities in other enterprises. Collaborative and cooperative strategic alliances trigger the procurement of expensive mainframe computers that help in regulating container movement, accepting order and bookings, and issuing bills of lading

(Luo et al., 2009; Musso et al., 2000). Recently, there has been a growing trend toward container shipping and transport firms forming collaborative and cooperative strategic alliances on a global scale with carriers forming partnerships that cover their operations globally while retaining ownership and distinctive marketing identifiers for other shipping lines (Elena and Yulia, 2021; Caschili et al., 2014; Heaven et al., 2001; Yip et al., 2012). Furthermore, collaborative and cooperative strategic alliances add values to container shipping and transportation chain's logistics performance by making it easier for alliance partners and consumers to access more loops of services with relatively low-cost consequences (Chalermpong, 2020; Charlampowcz, 2018; Laem, 2019; Zhang and Lam, 2014). Container shipping is extremely competitive and capital intensive requiring high collaboration and cooperation to secure the unity and benefits of alliances (Sjostrom, 2010; Talley et al., 2014; Piere, 2000).

Inconsistent with the above argument (Hanane et al., 2021; Wong et al., 2018; Ascencio et al., 2014; Evangelista and Mavillo, 1999), upheld that the confluence of competitive economic and operational dynamics has produced new and enlarged logistical issues for container shipping and transportation companies which are necessitated for a new paradigm shift in global alliances that would increase alliance partners information sharing and communications, logistics efficiency and effectiveness in responding to changes in customers' expectations, entering into new forms of alliances that broadened diffused traditional conference agreement. Meanwhile, Gibbs et al. (2014), Hall and Hao (2019), and Elnaz et al. (2018), agreed that the emergence of global collaborative and cooperative strategic alliances in the container shipping and transportation industry would incorporate all kinds of alliances such as a slot exchange programme, vessel trust model, and a collaborative services enterprise which are a significant development in global alliances reformation. Arguing further, Alix et al. (1999), Lorange and Roos (1992), Lai et al. (2020) and Wang (2017), declared that collaborative and cooperative strategic alliances would improve container shipping and transportation companies' logistics performance by providing effective and efficient customer services, increasing profit margin, on-time delivery, costs reduction, customer satisfaction, and spreading risk associated with investment among alliance partners.

Authors' empirical and theoretical investigations (Hanane et al., 2021; Elena and Yulia, 2021; Chalermpong, 2020; Caschili et al., 2014) asserted that there has not been universally agreed stabilise dimensions of global alliances that can handle organisational complexity and perceived competition that undermines trust and integrity of alliance partners in container shipping and transportation companies based on competition policies enacted under several regulatory regimes that have harmed conference and alliance coordination and cooperation efforts. Maintaining the same line of argument, Ascencio et al. (2014), Sony and Paneyides (2008), Telser (1982) and Evangelista and Morvilla (1998), argued that collaborative and cooperative strategic alliances are sacrosanct for alliance partners' sustainable competitive environment, concerning the capital acquisition, technical know-how in ships' terminal and vessels' sailing security, spreading of risks and diversification leading to unity and benefits of members in respect to effective and efficient logistical activities. This new paradigm shift in global alliances would enable alliance partners in container shipping and transportation firms to buy and run mega-ships at lower unit costs, improve logistics performance by providing consistent services and increase carrier's ability to differentiate their logistics services (Williamson, 1981; Lai et al., 2020; Notteboom et al., 2017; Wang, 2017; Agarwal et al., 2007). The authors also believed that forming collaborative and cooperative strategic



alliances is critical to acquiring access to supplementary services and increasing brand awareness in new markets, lowering service frequency, improving connections between ports, ensuring dependability and decreasing lengthier queues, and balancing inventory and buffer costs for various shippers (Jacobsson et al., 2018; Merk, 2018a, 2018b; Slack et al., 2002). Assenting to the above argument we will now proceed to examine these suggested dimensions or forms of strategic alliances by using scholarly inquiry to enable us bridge the gap in this work and formulate our research hypotheses.

Chalermpong (2020) conducted research on shipping collaboration model for the new generation of container ports in the innovation districts by creating a prototype of the shipping collaboration model that shows what containers ports should do either on their own or in collaboration with participants as representatives of the innovation districts. The research variables used in the model were taken from previous studies, and with the help of a questionnaire retrieved from strategy managers and senior supervisors of shipping lines and freight forwarder companies, the author created a survey about the anticipated collaboration attributes of users in the investigated domain. The study's findings highlighted the need for terminal operators, port authorities and users to create new collaboration strategies that involve port digitisation and adoption of environmentally friendly technology. The researcher concluded that these strategies would play a significant role in increasing the capability, energy efficiency and sustainability of the container port.

Chiu and Wang (2019) conducted empirical research on how collaboration improves utilisation of production variables in the container shipping sector by utilising the Leontief production function's superadditivity. The results showed that when shipping companies collaborate to provide services through strategic alliances. The utilisation rate of production factors will increase. They upheld the use of two production factors, container ship slot and container circulation velocity to empirically demonstrate the existence of the efficiency improvement effect on strategic alliances which have evolved into formal collaborative mechanisms and have undergone continues restructuring. Likewise, Lai et al. (2020) investigates the effect of collaborative decision making on logistics services performance for container shipping service using 142 survey responses from respondents and a two step structured equation modelling approach with confirmatory factors analysis to test the hypotheses. Their findings demonstrated that the integration of external information has a favourable influence on collective decision making, and that collective decision – making has a positive impact on the performance of logistics services for container shipping companies.

Furthermore, Myhr and Spekman (2005) explored how partners might achieve collaboration under different conditions by creating trust – based social foundations and by leveraging electronically mediated interchange with a sample of 157 supply chain relationships from Nordic multinational corporation's international branches. A conceptual framework emphasising the importance of trust in fostering collaboration was created. The study discovered that trust and electronically mediated communication can both lead to cooperative collaboration. Likewise, Fawcett et al. (2012) used a two-stage qualitative study methodology to evaluate supply chain trust as the driving force behind innovation. Their research demonstrates that the foundation of cooperation innovation capabilities is trust. According to the study's findings, collaborative alliances cannot be established or sustained without a foundation of trust.

Nevertheless, Elnaz et al. (2018) investigated how cooperation among shipping lines affect the price of transportation and pollution emission by analysing two weeks' worth

of import and export container movement for the port of Brisbane which served as the basis for the stimulation-based model evaluation of the status quo and the cooperation possibilities. According to the study results, working together among shipping firms significantly reduces the amount of time empty container storage is stored and the number of unnecessary truck moves. The cooperation results in the sharing of trucks and the use of huge empty trucks, which are more economical and cost-effective options than smaller trucks. Equally, Caschili et al. (2014) used data set made up of 65 carriers that offer 603 container services to explore the necessity for cooperation among carriers in the shipping business. In order to research how shipping businesses integrate and coordinate their actions and to look into the topology and hierarchical structure of relationships between carriers, they also employed network analysis and built the cooperative container network. The study's conclusions showed that small to medium – size carries make up the majority of cooperative companies. These cooperative companies partner with larger carriers to compete, particularly with the biggest carriers by reducing cost through commercial agreements. To improve their local and specialised market penetration, they observed that shipping companies with huge capacity collaborate with other carriers by simply looking for local partners.

Whereas, Elena and Yulia (2021) investigated the cooperation between sea ports and carriers in the logistics by employing a literature review as a source of information, and using statistical data and expert opinions to examined the efficiency of horizontal and vertical cooperation between ports and carriers. Additionally, they developed a mathematical model based on a cooperative game theory and numerical analysis. The outcome showed that the cooperation strategy of shipping companies is highly reliant on the state of the supply and demand of vessels. They maintained that a port that engages with shipping lines will see a considerable decrease in port fees, which has the benefit of increasing port request. Finally, based on a survey of related literature, Das and Teng (1998) also conducted a study on strategic alliances and found that they have been acknowledged as environment with the ability to foster cooperative behaviour among partners. They opined that a company must have enough faith in its partners' cooperation behaviour. The authors explored the idea of partner cooperation in the review and proposed that it is derives from two different services trust and control. Moreover, they argued that control and trust are related ideas and that their interaction adds to the process of building confidence. Furthermore, they proposed that control is a mechanism that affects trust levels and trust levels reduce the effects of control mechanism in deciding the level of control.

The aforementioned findings provide evidence in favour of general collaboration and cooperation attributes, teamwork qualities, concepts in supply chain and inter firm dependency as strategies in business decision making processes which are comparatively narrow. From the foregoing investigations, it appears that no study has been done on the correlation between collaborative strategic alliances and cooperative strategic alliances with respect to logistics performance of container shipping and transport firms. The lack of academic research on collaborative and cooperative strategic alliances which would have spurred advances in alliances methodologies and techniques is likely the root of the alliance's failure. Therefore, in order to address a knowledge gap, this study aimed to investigate these constraints. However, the above studies are pertinent to the study because they provide a framework for the enlarged model of strategic alliances that we have proposed.

## 2.1 Collaborative strategic alliances

Strategic collaboration is a decision-making process among autonomous parties, which entails sharing decision-making and communal accountability for outcomes (Stank et al., 2001; Wong et al., 2018). Collaborative strategic alliance is an effective, voluntary, mutually shared process that is goal and objective oriented in which two or more organisations collaborate, share resources, and achieve common goals (Yavuz, 2011; Wibisono and Jittamai, 2015; Bahinipati et al., 2009). Collaborative strategic alliances enable businesses to personalise their offerings to the individual needs of their preferred clients by determining their long-term needs, expectations, and preferences (Myhr and Spekman, 2005). Lambe et al. (2002) argued that collaborative strategic alliances lead to increased internal and external collaboration among alliance partners. As container shipping and transport firms strive for competitive advantage through external collaboration, they must also become more focused internally to effectively respond to client expectations and meet customer needs. Narus and Anderson (1996) maintained that collaborative strategic alliances reduced resource duplication, increased relevance to client's demands, and flexibility in reacting to specific customer requests and accommodating change. Stank et al. (2001) asserts that when alliance partners comprehend others' perspective, exchange knowledge and resources, and achieve common goals, collaborative alliance benefits emerge. Cassivi (2006) argued that in container shipping and transportation enterprises, collaborative mechanisms as a dimension of strategic alliances enhance information flow in a multi-tied partnership.

Collaborative strategic alliances in container shipping and transportation companies provide resources, and physical dynamics that strengthen proximity and knowledge spillover for new marine transport services (Lai et al., 2008; Wu, 2012; Yang and Lim, 2017). A collaborative strategic alliance is a strategy for achieving alliance partners' goals and objectives which includes customer research, infrastructure planning, and information management on ships' arrivals, as well as communication among port operators such as terminal technicians, portals, and other shipping lines to meet demand on specific trade routes through vessels sharing (Chiu and Wang, 2019). Collaborative strategic alliance assists alliance partners to improve their logistics performance by forming alliances that will enable collaborators to attain their aims and ambitions in terms of shared resources, cost reduction, container handling, intermodal feeder services among players in the industry, like shipping lines and container terminal providers (Zhou and Kim, 2020; Yang et al., 2011). This strategy helps an organisation to collaborate for the mutual advantage that goes beyond ambiguous declaration for partnership and aligns member interests toward mutually beneficial strategies that will lead to increased customer requirements, a greater variety of routes and profit maximisation (Ascencio et al., 2014; Cairou, 2008; Wong et al., 2008). Based on the foregoing, the first hypothesis is put forward for testing thus:

H1 Collaborative strategic alliances correlate significantly with the logistics performance of container shipping and transport firms in Nigeria.

In conceptualising collaborative strategic alliance as a dimension of strategic alliances, Notteboom et al. (2017) argued that collaborative strategic alliances foster horizontal, vertical and full-time integrated collaboration in container shipping and transportation companies' logistics performance with terminal operators and other shipping lines resulting in increased port performance by alliance members. Tongzong (2009),

considered the importance of strategic collaboration alliances in improving the logistics performance of container shipping and transportation enterprises as innovation and techniques for the shipping industry to become the preferred choice of freight forwarders based on port efficiency, and infrastructural facilities resulting from alliance partners' contributions. Also, Jacobsson et al. (2018) assert that collaborative alliances correlate with logistics performance of container shipping and transportation firms permit real-time data interchange between alliance partners' seaports and road transporters which helps in reducing port congestion and long turnaround time while also expanding their service network.

Sony and Paneyides (2008) maintained that effective and efficient logistics performance in shipping and transportation would help alliance partners collaborate with other transport and shipping lines via six channels; ties with technical operators, upgraded services, interaction with freight forwarders, transport-mode merger, channel integration, and applications for data exchange. Successful application of collaborative strategic alliances improved the efficacy and efficiency of shipping and transport enterprises' logistics performance in terms of information flow that may be used to make the right decision in the complex network of the transportation chain (Panayides and Lun, 2009; Wong et al., 2009; Lun et al., 2011). Meanwhile, Hall and Hao (2019) and, Parola et al. (2014), submitted that collaborative strategic alliances enhance the performance improvement in logistics processes of containership and transportation firms by allowing collaborators to collaborate on process design, information sharing, mutual learning, negotiation, enhance digitisation, resilience in terms of increased risk and uncertainty, equity joint venture improvement, contractual equity agreement enhancement, equity consortia improvement, and better mergers arrangements. Finally, Laem (2019) sheds light on the benefits of the collaborative alliance as techniques for eliminating conflict arising from governmental regulations that control operational activities of container shipping and transportation firms' activities.

## *2.2 Cooperative strategic alliances*

Cooperative strategic alliances refer to organisational altruism described as the voluntary requirements for cooperation which is categorised as successful recruitment of self-interests as a basis for negotiation and trade, justification of broader interests and the construction of a broad rather than restricted base for inter-organisational contacts, and awareness of the function and dynamics of trust. Cooperative strategic alliances in container shipping and transport firms involve an effort by alliance companies to achieve their goals and objectives by cooperating with other companies instead of competing with them to enhance their logistics performance (Child et al., 2005; Elena and Yulia, 2021). According to Zhou and Kim (2020), cooperative strategic alliances in container shipping and transport firms will promote corporate strategy and improve logistics services offered by carriers to shippers. Similarly, Das and Bing-Shang (2009) and Sony and Panayides (2002), maintained that cooperative strategic alliances provide alliance carriers in container shipping and transport firms significant benefits for companies that lack specific competencies or resources by enabling them to acquire these through partnerships with entities with equivalent skills or assets that increase shippers' satisfaction through effective and efficient logistics services. In the views of Parola et al. (2014), and Mohammad et al. (2022), cooperation in container shipping and transport firms requires a degree of mutuality and trust between partners' short and long-term

goals, as well as between sectoral and system-wide interests. In the assertion of Chang et al. (2012), Balci and Cetin (2017), and Faulkner (1995), cooperative strategic alliances in container shipping and transport firms are based on confidence to defend one another from external dangers and commitment to long-term investment to attain economies of scale and scope. Cooperation in container shipping and transport firms among carriers, shippers, suppliers and customers can also facilitate access to new markets and provide opportunities for mutual convergence of harmony leading to effective and efficient logistics performance in terms of service and product offering (Rau and Spinler, 2017; Caschili et al., 2014; Cairou and Guillotreau, 2021).

According to Heaven et al. (2005), Merk and Teodoro (2022) and Musso et al. (2000), cooperative strategic alliances are not new, they are becoming increasingly relevant in today's globalised society where alliance companies can gain direct exposure to a collaborator's technology or split the expense of developing new processes through research and development. In the submission by Yang and Lim (2017), Wang et al. (2016), and Czeny and Mitusch (2005), collaboration and cooperation in container shipping and transport firms might also allow them to combine their complementary capabilities to achieve synergies that improve their logistical efficiency and effectiveness in delivering of goods to shippers as scheduled. Cooperation issues fall under cooperative strategic alliances in a variety of ways; first and foremost, it should reflect the company's vision and objectives as laid forth by corporate management (Child et al., 2005; Sony and Panayides, 2002; Chang et al., 2012). The authors argued that if one goal is to achieve more innovation, alliances that guarantee accessibility to superior know-how and technology should be pursued. Furthermore, as previously said, the authors opined that cooperation might be sought as a means of sharing cost or risk of desired new development. Finally, they maintained that cooperation in container shipping and transport firms helps to enhance controlling and coordinating structure over the companies' various activities, particularly if they are growing through alliances with several partners in a given country where the cooperation must be keeping a unified voice.

The processes through which partners in the industry achieve their goals, objectives and procedures by cooperating for a common purpose or benefits within a relationship that promotes shared interest, unity, affinity or teamwork is known as "cooperative strategic alliance in container shipping and transport industry" as noted by Rau and Spinler (2017) and Chang et al. (2012). Cooperative strategic alliances are a mechanism by which a company deploys transformative resources and optimises assistance through knowledge integration (Fasika et al., 2014; Song and Panayides, 2008). Cooperative strategic alliances are viewed as resources that may assist businesses in gaining new knowledge and information about their industry, as well as contribute to the interchange of diverse resources such as monetary talents, technical know-how and capabilities that minimise a company's costs and consequently improve their performance (Elena and Yulia, 2021; Rau and Spinler, 2017). According to Caschili et al. (2014), cooperative strategic alliances result in the formation of equal-parts coalitions, which can lead to improved integration of container shipping and transportation logistics by cutting cost, eliminating duplication links, and allowing for more flexible route planning conditions.

Sjostrom (2010) maintained that cooperative strategic alliances aim to boost cargo delivery dependability and lessen the effect of potential supply shortages and timelines in seaports, which are an essential node in the international logistics chain, where complicated marine and land interfaces are implemented and thus help in managing

disruptions. Hall and Hao (2019), argued that cooperative strategic alliances will aid in reducing operational risks such as vessel movement schedules, port accidents, port equipment shortages, infrastructural decays and failures, inadequate management of hazardous materials, seaport traffic, low employee qualification, security breaches, and structures such as personal factors that impede communication, ethnic barriers, political concerns, and employee rivalries. Strategic cooperative alliance improves the long-term viability of coalitions, increases the profitability of alliance enterprise by focusing on various transportation segments, and manages traffic at close range, because the freight forwarder and the terminal are two independent aspects of the logistics system that do not compete directly (Song et al., 2001; Parola et al., 2014). In the view of Panayides and Lun (2009), and Tally et al. (2014), strategic cooperative alliance makes coalitions in the shipping and transportation industry easier and more profitable by integrating vertical, horizontal and full-time cooperation to effectively satisfy maritime logistics and raise service levels. It allows container shipping companies to select landing terminals for their ships which has become more vital for the industry partners to collaborate to ensure long-term success (Panayides and Wielder, 2011; Evangelista and Marvillo, 2000). The number two hypothesis is hereby proposed for testing based on the preceding rationale:

H2 Cooperative strategic alliances impact significantly on the logistics performance of container shipping and transport firms in Nigeria.

In conceptualising H<sub>2</sub> as a dimension of strategic alliances, it is upheld by some authors that strategic cooperative alliance is germane in logistics efficacy of the firms in the industry by facilitating the exchange of information through collaboration and integration of logistics components such as customer service, fleet mix, logistical operations, inventory control, planning, packaging and handling transportation efficiency and effectiveness (Ma et al., 2020; Elena and Yulia, 2021; Lun and Brown, 2009). Also, Wong et al. (2009), Heaver et al. (2005), and Czeny and Mitusch (2005), submitted that a strategic cooperative alliance encourages information exchange through a variety of cooperation that can aid in the improvement of logistics performance of container shipping and transportation firms in expanding their operations and lowering their expenses to varying degrees in terms of customer services, product quality, and market access ability. In conceptualising cooperative strategic alliances as a dimension of strategic alliances, other authors observed that cooperative strategic alliances improve the efficiency and effectiveness of container shipping and transportation company's logistics processes by fostering all-round port-to-land-carrier coordination, minimising the disruption's impact and lowering overall logistics costs (Slack et al., 2002; Musso et al., 2000; Telser, 1982; Garcia et al., 2019). They authors opined that cooperative strategic alliances strengthen the collaboration of terminals' operators in direct range to one another, improves service quality for the primary customers' liner carrier, and also facilitate transportation cost reduction. Finally, it is theorised that strategic cooperative alliance triggers efficiency and effectiveness in logistical processes of container shipping and transportation firms by unifications of carriers outlying terminals and hubs into a single coalition, allowing such collaborations to increase the amount of loading and unloading operations, incentivising sea route providers to earn a consistent income, from port operations (Lun and Cairou, 2009; Parola et al., 2014; Rau and Spinler, 2017; Hall and Hau, 2019).

**Figure 1** Conceptual framework on the role of strategic alliances in logistics performance of container shipping and transport firms

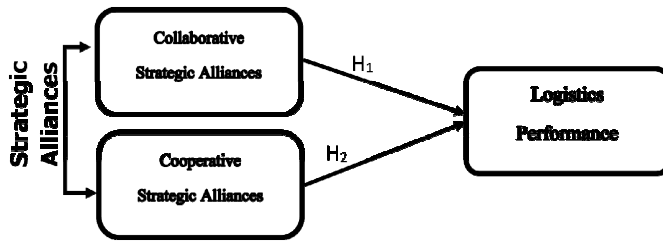


Figure 1 depicts the conceptual framework to be drawn on a resource-based perspective and resource dependence theory to develop the above model and empirically test the relationship between collaborative and cooperative strategic alliances on container shipping and transport firms' logistics performance in terms of logistical efficiency and effectiveness, using data collected from shipping and transport firms in Nigeria. While the resource-based view is used as the anchored structure theory, resource dependence theory is used as a supplementary theory that is integrated to define the model to further our understanding of whether critical and complementary resources influence the correlation between collaborative partnerships and container shipping and transportation enterprises' logistical efficiency. The proposed ideas, as well as the theoretical justifications that go with them, are discussed in the following sub-sections.

### 2.3 Resource-based view theory

Jih-Jeng et al. (2005) argued that the resource-based view presents a different perspective on strategic alliances, claiming that strategic alliances are motivated by valuable resources that corporations do not possess. Barney et al. (2011) maintained that several classifications of resources have been presented in previous publications broadly classified into tangible and intangible resources. While Diego and Giovanni (2018) upheld that businesses should consider how to build and expand available resources to establish a capability for a long-term competitive edge and the capacity to adapt quickly to a changing environment. Similarly, Arni et al. (2007) opined that complementary resources are sought by businesses to create connections and obtain a long-term competitive edge. Furthermore, Das and Bing-Shang (2000) said that strategic alliances, mergers and acquisitions concerning a resource-based view are methods for gaining access to other organisational resources to achieve competitive advantages and values to the firm that would otherwise be unavailable. In the assertion of Barney (1991), and Jih-Jeng et al. (2005), the combining of resources amongst alliances is emphasised in the resource-based paradigm. Whereas Das and Bing-Shang (2000) stated that studies have looked into the resource-based approach of alliances under a variety of labels, including the property rights 'viewpoint, organisational capabilities approach, and the general rationale of entering into strategic alliances.

Authors such as Freeman et al. (2021), Das and Bing-Shang (2000), Arni et al. (2007), maintained that when value resources cannot be gained efficiently via a barter system or consolidations, resource-based view theory can be used to trigger strategic collaborative and cooperative alliances in aggregating sharing or exchanging valuable resources with other firms. In summary, they argued that incorporating a resource-based paradigm into strategic collaborative and cooperative alliances to improve on logistics

performance of container shipping and transportation firms is about generating resources by merging them with others so long as the combination yields the best results. To obtain access to resources, companies may create alliances or engage in mergers and acquisitions held by an uncooperative actor or other companies that are valued and necessary for gaining a competitive edge (Barney, 1991; Barney et al., 2011). According to Das and Bin-Shang (2000), and Diego and Giovani (2018), container shipping and transportation corporations can enter global markets by acquiring a local business and creating international joint ventures with their local stakeholders to take advantage of their local partners' resources, such as local facility, expertise and contacts. Integrating a resource-based paradigm into strategic collaborative and cooperative alliances notifies alliance management of the crucial need for effective and efficient alliance capacity convergence success leading to logistical efficacy and effectiveness in container shipping and transportation firms (Kozienskoya et al., 2013; Diego and Giovani, 2018).

The theory is critical to this study because container shipping and transportation firm managers may now systematically analyse their options for potential alliances to create acceptable alliance resource alignments. It is also pivotal to the performance enhancement of container shipping and transportation firms' logistical efficiency and effectiveness. Das and Bing-Shang (2000) argued that managers can also see that excessive resource alignment does not hurt alliance efficiency, and figure out how to change it. In brief, Jih-Jeng et al. (2005) maintained that firms can receive complimentary resources from their partners through collaborative and cooperative strategic alliances by allowing them to expand or reorganise their internal processing to generate collaborative and competitive benefits in the shipping and freight industries. Even though the resource-based view proposes a credible viewpoint on a company's resources to clarify the establishment of collaborative relationships, Jih-Jeng et al. (2005) asserted that some critical questions remain, such as what standards should be used to build partnerships when enterprises lack preferred resources and competencies. Furthermore, Freeman et al. (2021) noted that such an entity may have access to the resources of its collaborators. According to Jih-Jeng et al. (2005), what should the company do now that they have allied? Meanwhile, Diego and Giovani (2018) opined that firms will not be successful except if they can put their newly acquired resources to good use. To put it another way, Kozienskoya et al. (2013) claimed that whether enterprises can create synergies and competitive edge depends on resource allocation optimisation strategic partnership formed largely based on resources.

### *2.3.1 Resource dependence theory*

Resource dependence theory is a useful framework in this study because it combines the concepts of a collaborative and cooperative strategic alliance to eliminate power imbalances that leads to dependency on one another while also improving the perceived economic position of players (Chiambaretto, 2015). According to Afacan (2019), Shymko and Das (2012), businesses seek out resources to eliminate or reduce dependency on others, while also bringing people to desirable future outcomes using a resource dependence perspective. The resource dependency paradigm is founded on the idea that to acquire resources, an organisation must participate in a transaction with other individuals and organisations in its environment (Aldona and Szymaniec, 2012; Yuliya and Diaz, 2010). Hillman et al. (2009) also maintained that such transactions may be beneficial and also create unintended consequences. Furthermore, the resources that the



organisation requires may be scarce, difficult to obtain or under the control of uncooperative actors (Afacan, 2019). As a result of this unequal trade, disparities in power, authority, and access to additional resources emerge. Based on some scholars' assertion, cultivating cordial relationships among alliance actors -requires strategic collaborative and strategic cooperative alliances that will strengthen partners' confidence, honesty, and commitment in resource-related transactions, avoiding such restrictions in resources by actors in the container shipping and transport firms, thereby enhancing their logistics performance by forming collaborative and cooperative arrangements that clearly define the benefits of long-term trust-based collaboration, pursue innovation across the whole value chain via collaborative and cooperatively managed networks of industry players (Yuliyana and Diaz, 2010; Jih-Jeng et al., 2005; Chiambaretto, 2015; Afacan, 2019; Jih-Jeng et al., 2005; Chiambaretto (2015; Shymko and Diaz, 2012).

#### *2.4 Logistics performance*

As a subset of supply chain management, logistics management coordinates, executes and oversees the efficient movement and safe-keeping of products, resources, and data files to satisfy customer demands (Mpuon et al., 2020, 2021c, 2023). According to Wong et al. (2012), collaborative and cooperative solutions that can improve logistics performance in terms of supplier input must be done at the correct time, in the appropriate amount, and in the highest possible quality to completely meet the operational needs of alliance organisations in container shipping and transport firms. Lun et al. (2010) also noted that collaborative and cooperative alliances are crucial to the amount of transportation and logistics services that carriers will generate and sell. The authors further maintained that collaborative and cooperative alliances in container shipping and transport firms are pivotal in alliance partners' determination of freight rate, which is very crucial in the manufacturing of containers, efficiency and effectiveness of logistics shipping services. Foreign commerce is enhanced by logistics and distribution, which contribute considerably to the growth and development of the local economy. The quality and effectiveness of logistics services can be significant for international commerce since a lack of logistical facilities and internal operations can be a major impediment to global trade integration (Gani, 2017). According to Fugate et al. (2010), Mpuon et al. (2021a, 2021b, 2023), logistics performance in container shipping and transport firms is multi-dimensional, and it refers to the degree of efficiency, productivity, and distinctiveness associated with the accomplishment of logistics-related tasks. Borch and Henk (2018) argued that a wide range of stakeholders have an impact on logistics services and add to the need for more clarity in the demands made on ship-owners in terms of achieving logistics goals. They maintained that in many businesses, efficient movement of products along the supply chain with timeliness is critical. They further noted that contractual relationships with carriers must include an assessment of logistical performance standards as part of the control process.

Munim and Schramm (2018) opined that the role of container shipping and transport enterprises has evolved into advanced production technologies that have become highly diversified in the global supply chain. In an increasingly globalised world, the logistics service provider is now a key element of maritime operations, which is no longer limited to cargo handling. They pointed out that logistics costs and supply chain dependability are the most important aspects of logistics performance in this circumstance. In the assertion of Borch and Henk (2018), Siddig and Hamid (2012) logistics performance is

an appealing benchmarking tool developed by logistics corporations and the world bank to assist countries and firms in identifying the issues and possibilities they have in their trade logistics performance, as well as what they can do to enhance it. The authors argued that it is the weighted average of countries or a company's scores on six criteria; customs efficiency and effectiveness, logistics service quality, infrastructure quality, the convenience of arranging shipments, consignment tracking and shipment timeliness. Siddig and Hamid (2012) noted further that a range of metrics is measured by logistics performance indicators, most of which are related to purchasing warehousing, transportation, and delivery of goods. According to Siddig and Hamid (2012) logistics performance has been measured using efficiency and effectiveness as major indicators. Gani (2017) declared that one of the goals of producers is to safely deliver items to consumers at a low cost, so effective and efficient transport and logistics system help to increase the connection of many interdependent production sectors of the domestic economy. The role of logistics in container shipping and transportation firms can only be fulfilled if performance is improved. The performance of logistics is examined at the corporate level, with an emphasis on intra-organisational contact and assessment, as well as the overall operational performance criterion selection process influenced by the goals and expectations of several stakeholders, such as freight forwarders, consumers, government, and regulatory agencies. Furthermore, environmental concerns have become a critical factor in international shipping and transportation.

Yang and Lim (2017) explored the resource – based perspective on logistics performance in the shipping industry by using factor analysis to identify the key intra – firm resources such as tangible assets and intangible assets, inter – relationship such as; communication, long-term relationships and logistics service capabilities such as service efficiency, service reliability, service capability and value-added service. In order to test the research hypotheses, the survey data were analysed using a structure equation model. The results demonstrated that intra – firm resources and logistics performance are mediated by intra firm interactions and the ability of logistical services. Whereas, Fugate et al. (2010) analysed the nature of logistics performance and the contribution of logistics to organisations by systematically examining the effect of logistics performance on organisational performance as the second – order formative constructs of logistics performance which consists of three aspects, efficiency, effectiveness and differentiation. These constructs were tested using structured equation modelling. The research demonstrated that logistics performance has a beneficial impact on organisational performance. The selection of the measures of logistics performance in this study was supported by the aforementioned empirical results.

In this analysis, we adapt effectiveness and efficiency as indicators of logistics performance in container shipping and transportation firms from the work of Fugate et al. (2010). According to Fugate et al. (2010), effectiveness refers to a specified level of result attainment and is characterised as the capacity to collect resources. The proportion between realistic and actual outputs and standard or projected outputs is established through effectiveness. Effectiveness as argued by the authors is characterised as the capacity to achieve pre-specified objectives in satisfying client aspirations in key areas including product guarantee, in-stock accessibility, delivery time, and comfort. In container shipping and transportation firms, it refers to the degree to which logistical objectives are met. On the other hand, efficiency according to Fugate et al. (2010), Yip (2012), Siddig and Hamid (2012) focuses on the internal functionality of logistics which is commonly considered or best represented by the same ratio of real production levels.

Efficiency is defined in the context of container shipping and transportation companies as the proportion of resources used for the results obtained. Efficiency refers to the capacity to deliver the desired product and services in a combination of a price point that the consumer accepts (Fugate et al., 2010). In a larger sense, it refers to the logistics function's capacity to effectively manage resources.

### **3 Method**

This research examines the link between strategic alliances and the logistics performance of container shipping and transport companies. The present research used a quantitative cross-sectional survey approach to select 101 container shipping enterprises in Nigeria, including ocean freight ships, trucking, marine and logistics firms. A quantitative cross-sectional survey design enables a researcher to gather data from a large study population to conclude a particular group. It allows for the interaction between the investigator and the respondents to gather information, opinions, and attitudes, based on numerical data. The study's sampling framework includes certified container shipping and transport entities that are listed on the Nigerian stock exchange, and registered with the Nigerian Corporate Affairs Commission. The sample size is made up of the management personnel from the 101 firms that were chosen based on their significant contribution to the flow of products in and out of the country using judgmental sampling technique. In judgmental sampling technique, the choice of the sample units is solely based on the expertise of the investigator and experience with the sample unit, as well as the fact that selecting them will facilitate the collection of relevant data. Ugwuonah (2005) affirmed that this method entails a researcher actively selecting individuals as members of the sample based on their anticipated relevance to the study. The companies were chosen because they are continually active in moving items in and out of the country utilising containers of various sizes, shapes and weights. They are heavily involved in logistics networks such as carriers' movement planning, organisation, and commission between international locations. Strategic alliances and logistics networking of container shipping and transport activities are among the skills the management employees need. Each of the 101 firms was allocated 5 questionnaire copies by the authors and 10 others who were hired and trained for this purpose, totalling 505 questionnaire copies distributed.

To ensure that the study obtained a realistic and accurate cross-section of viewpoints from all of the selected firms, a multi-informant strategy was used. Data were gathered using a study tool called Strategic Alliance and Logistics Performance Questionnaire (SALPQ). Section A, B and C were the three portions of the questionnaire. Section A contains three questions about the respondents' demographic characteristics (sex, age, and educational qualifications). Section B has 20 items on the independent variables with ten items each on collaborative and cooperative strategic alliances. The dependent variables are covered in part C containing 11 items with five items on logistics performance, and three items each on effectiveness and efficiency. Efficiency and effectiveness were measured in terms of logistics performance. Except for the demographics of the respondents; all the components on the instrument were rated on a five-point scale of strongly agree, agree, disagree, strongly disagree and neutral which were scored 4, 3, 2, 1 and 0 respectively. To get the necessary information, the researchers, along with 10 others who were recruited and schooled specifically for this

project, distributed a structured study questionnaire including a hybrid of site visits. The employees of the 101 firms that were judged were given a total of 505 questionnaire copies as stated earlier. The variables of the study hypotheses were used to define the questionnaire items constructed. The surveys were then double-checked at the informant's workplace to ensure materials' consistency, accuracy and usability. As previously stated, the candidates were recognised in their various companies based on their designation and specified obligations. The goal of the study was explained to the participants and they were provided with a written guarantee of anonymity and confidentiality of their responses in form of cover letters. The information was gathered in two stages. The group's strategic business managers were first consulted on their impressions regarding the companies' business claims, based on their greater degree of exposure and extensive understanding of the firms. The formalised survey was then adopted to arouse the global alliance's senior executives' perspectives and fundamental concerns concerning strategic alliances and logistics performance. Following repeated checkups and notifications employing mobile phone calls and texts to participants at the organisational level such as risk analysts, ship superintendents, vessel managers, chief engineers, quality control inspectors, dispatches, ship captains, crane operators, logistics specialists, terminal operators, dockworkers, materials handlers and utility steward, drivers, 452 filled questionnaire copies showing a return rate of 89.5%. After checking for accuracy of the completed questionnaires, 18 of the retrieved questionnaires were deemed inappropriate for inclusion in the final analysis, resulting in a modified sample size of 434.

Frequency, percentage, descriptive statistics, Spearman rank correlation, and multiple regression were utilised to examine the data. The statistical package for the social sciences (SPSS version 20.0) was used for the data analysis. Confirmatory factor analysis (CFA) was used to evaluate the scale constructs' unidimensional validity and reliability. The complete instrument that supported the different structures contributed a significant amount of weight to each of the items. An analysis of the model fit statistics after removing the cross-loading features revealed strong and appreciative model – data as suggested by Byrne (2016). Importantly, because the average variance extracted (AVE) for the individual variables in Table 1 is greater than 0.5, and these values are also bigger than the squared correlation coefficient for any pair of constructs, which implies that all of the scales met the criteria for discriminating and composite reliability (Fornell and Larcker, 1981). The measuring scales were determined using Cronbach's alpha coefficient ( $\alpha$ ) and composite reliability (CR) scores. Both CR ratings are more than 0.7, implying a high level of trustworthiness. When seen as a whole, the CFA values show that the multi-item scales utilised in this study are unidimensional, authentic, and trustworthy. The validity and reliability of test results are shown in Table 1. Nevertheless, the level of causation between strategic alliances and logistics performance of container shipping and transport firms is being examined in this investigation.

The AVE obtained for all constructs was larger than 0.5, as shown in Table 1. Moreover, the greater the squared correlation coefficient for any pair of constructs, the more it indicates that the construct met the requirement for discriminate and convergent validity. Result also reveals that both the CR and Cronbach alpha coefficients for each of the constructs were greater than 0.70 meaning that the instrument is reliable. Based on these results, the instrument was adjudged valid and reliable.

**Table 1** Reliability and validity results for the research variables

<i>Construct</i>	<i>AVE</i>	<i>Max r<sup>2</sup></i>	<i>CR</i>	<i>Cronbach alpha</i>
Collaborative strategic alliances	0.578	0.263	0.876	.887
Cooperative strategic alliances	0.581	0.259	0.893	.930
Effectiveness	0.703	0.305	0.739	.936
Efficiency	0.875	0.360	.909	.801
Logistics performance	0.753	.582	.745	.713

Notes: AVE – average variance extracted; CR – composite reliability.

## 4 Results

The demographic statistics show that 338 respondents (77.9%) were male and 96 respondents (22%) were female. The respondents' age distribution reveals that 13.8% of the study population were between 20–25 years while 17.5%, 25.8%, 18.9%, 12.4%, 9.4% and 2.1% of the respondents were between 26–30 years, 31–35 years, 36–40 years, 41–45 years, 46–50 years and 51 and above years respectively indicating that the majority of the respondents were between 31–35 years. The distribution of the educational level of the respondents reveals that more than half of the respondents (56.9%) were first degree holders, while 12.9%, 16.4% and 13.8% of the respondents had below first degree certificates, MSc/MBA and PhD holders respectively. The impact of the demographic profile on the study's sex-role findings revealed that men dominated the workforce in container shipping and transport companies, and the work culture is characterised by masculine ideals. This result corroborated the findings of MacNeil and Ghost (2016), who maintained that even though the container shipping and transport industry has taken steps to close the current gender gap, women's integration into the industry has been slow due to a variety of obstacles. The authors argued that if a woman chooses to work in the container shipping and transport industry today, she will be confronted with numerous hurdles. Physical, social and economic difficulties are all common complaints. Challenges come in many forms and can be so severe that they affect women's ability to stay in their ideal jobs, with many quitting after a few years. In the maritime sector, sexual harassment and abuse are prevalent and pose a significant barrier for women.

The implications of age in the study findings suggest that more prime-age workers ranging between 30 to 40 years are now being employed, implying that productivity for prime-age workers in the container shipping and transport firm industry is projected to be higher than that of the younger and older workers. This outcome agrees with the findings of Ozan et al. (2021) that container shipping and transport companies face a significant issue in locating people with the necessary capabilities to manage the whole supply chain. There is a need for younger shipping officers and truck drivers with skills and expertise to enhance the performance improvement of the industry. Ozan et al. (2021) maintained that quality drivers are becoming increasingly scarce, and companies are aggressively seeking to fill their gaps. The authors opined further that shipping and transport businesses need to rely on their logistics efficiency and effectiveness to adapt work environments to the need of the young, prime-age and older people to prevent hazards to productivity and quality.

**Table 2** Descriptive statistics for the research variables

	N		Minimum		Maximum		Mean		Std. deviation		Skewness		Kurtosis	
	Statistic		Statistic		Statistic		Statistic		Statistic		Statistic		Statistic	
Collaborative strategic alliances	434		10.00		20.00		13.24		3.51		0.50		-1.38	
Cooperative strategic alliances	434		10.00		28.00		13.23		4.55		1.86		2.47	
Effectiveness	434		5.00		16.00		7.29		2.35		1.78		3.93	
Efficiency	434		5.00		14.00		6.99		1.89		1.61		3.82	
Logistics performance	434		10.00		30.00		14.28		4.11		1.75		4.53	

Based on the fact that for many years, managers in container shipping and transportation enterprises were either untrained or craftsmen learning on the job with inadequate abilities, educational qualifications metrics from the investigation showed a considerable improvement. The finding is supported by the study of Egben (1999), which declared that the Nigerian maritime education and training system, which was designed to offer training for all ranks of the marine profession, has resulted in a major improvement in respondents' educational qualifications. Kiplimo and Ikua (2017) argued that the training's major goal was to develop skilled officials who could oversee the joint-shipping and transport operated common services. Similarly, Lalith et al. (2016) highlighted that the natural expansion of marine students' enrolments does not correspond to commercial demand. They discovered that changing requirements within the maritime industry are a driving force behind aspiring practitioners pursuing postgraduate maritime degrees, with such programmes focused on human capital management by preparing and educating maritime experts to assure continuous good and effective freight services within the dynamic shipping and transportation business.

The descriptive statistics for the research variables are shown in Table 2. The mean score of 13.24 was obtained for collaborative strategic alliances while for cooperative strategic alliances, the mean score of 13.23 was obtained meaning that the two strategic alliance variables were rated almost the same though collaborative strategic alliances were slightly rated more than cooperative strategic alliances. The standard deviation of 3.51 and 4.55 was obtained for collaborative strategic alliances and cooperative strategic alliances respectively which indicate that the respondents' scores on cooperative strategic alliances were more consistent compared with that of collaborative strategic alliances. For effectiveness and efficiency, the mean scores of 7.29 and 6.99 with a standard deviation of 2.35 and 1.89 were obtained which implies that effectiveness as a logistic performance variable was more rated by the respondent than efficiency through respondents' scores on efficiency were more consistent than that of effectiveness. The skewness obtained for all variables was more than 0 meaning that the research variables are skewed to the right and hence the relationship between research variables as presented in Table 2 was carried out using the non-parametric correlation (Spearman correlation).

**Table 3** Non-parametric correlation between research variables

<i>Variables</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
1 Collaborative strategic alliances	1				
2 Cooperative strategic alliances	.954**	1			
3 Effectiveness	.759**	.810**	1		
4 Efficiency	.757**	.767**	.890**	1	
5 Logistics performance	.808**	.837**	.985**	.948**	1

Notes: \*Significant at 5% ( $p < .05$ ), \*\*Significant at 1% ( $p < .01$ ).

The result in Table 3 shows that collaborative strategic alliances have a significant positive relationship with effectiveness ( $r = .759$ ,  $p < .01$ ), efficiency ( $r = .757$ ,  $p < .01$ ) and logistic performance ( $r = .808$ ,  $p < .01$ ) which implies that collaborative strategic alliances are more likely to bring about an improvement in effectiveness and efficiency and consequently Logistics performance. A similar result was obtained for cooperative

strategic alliances as it reveals a significant positive relationship between effectiveness ( $r = .810, p < .01$ ), efficiency ( $r = .767, p < .01$ ) and logistic performance ( $r = .837, p < .01$ ).

**Table 4** Multiple regression showing the role of strategic alliances (collaborative strategic alliances and cooperative strategic alliances) in logistic performance

Variables	Dependent variable: efficiency		Dependent variable: effectiveness		Dependent variable: logistic performance	
	B	t-value	B	t-value	B	t-value
Constant	.488	2.85**	1.405	6.678**	1.894	5.235**
Collaborative strategic alliances	.111	5.04**	.328	12.063**	.439	9.400**
Cooperative strategic alliances	.403	23.56**	.094	4.468**	.496	13.742**
<i>Summary statistic</i>						
R2	0.851	0.651	0.782			
F-value	1,226.68	402.13**	775.19**			
p-value	0.000**	0.0000	0.000**			

Notes: \*Significant at 5% ( $p < 0.05$ ); \*\*Significant at 1% ( $p < 0.01$ ); VIF – Variance inflation factor.

Result in Table 4 presents summary of the regression analysis between strategic alliances and logistic performance as well as each of the logistic performance dimension (efficiency and effectiveness). For each of the regression model, the variance inflation factor (VIF) values was less than 5.0 indicating that there is no evidence of multicollinearity. Result shows that the three regression models were significant ( $p < .05$ ). The adjusted  $R^2$  of .851, .651 and .782 were obtained for the relationship between strategic alliances with efficiency, effectiveness and logistic performance respectively. This indicates that strategic alliances accounted for 85.1% of the variation in efficiency, 65.1% of the variation in effectiveness and 78.2% of the variation in logistic performance. Result shows that collaborative strategic alliances ( $\beta = .111, t\text{-value} = 5.04, p\text{-value} = 0.000, p < .01$ ) and cooperative strategic alliances ( $\beta = .403, t\text{-value} = 23.56, p\text{-value} = 0.000, p < .01$ ) both have significant positive impact on efficiency while also both collaborative strategic alliances and cooperative strategic alliances were also found to have significant positive impact on effectiveness ( $p < .05$ ). Similarly, the result also indicates that collaborative strategic alliances ( $\beta = .439, t\text{-value} = 9.40, p\text{-value} = 0.000, p < .01$ ) and cooperative strategic alliances ( $\beta = .496, t\text{-value} = 13.742, p\text{-value} = 0.000, p < .01$ ) both impacts significantly on logistics performance of container shipping and transportation firms. Result also reveals that among the two strategic alliances variables, cooperative strategic alliances play more significant role in logistics performance of container shipping and transportation firms than collaborative strategic alliances.

#### 4.1 Discussion of the findings

The multiple regression analysis results between strategic alliances and logistics performance as well as each of the strategic alliance dimension and logistic performance measures revealed that a significant relationship exists between strategic alliance



dimensions as evaluated by their impact on container shipping and transport firms' logistics performance. This is because collaborative and cooperative strategic alliances as consented by Chalermpong (2020), Elena and Yulia (2021), Elnaz et al. (2018), Chiu and Wang (2019) and Das and Teng (1998) are specifically designed to ensure trust, confidence, reliability, and flexibility in the face of high uncertainty, encouraging effective and efficient logistical services by lowering costs, improving logistics reliability and differentiation of service, frequency in delivering schedule and reducing concentration. The study findings acquiesce with the findings of Elnaz et al. (2018), Panayides and Lun (2009), Zhang and Lam (2014) and Wang et al. (2016) that collaborative and cooperative alliances improved container shipping and transport firms' logistics performance by improving schedule reliability, vessel sailing time, service differentiation and reliability, sailing frequency, cost minimisation, and increase the perceived value of containerised freight transportation time. Collaborative and cooperative strategic alliances in line with the study of Lai et al. (2020) enhances efficiency and effectiveness in the logistics performance of container shipping and transport firms as revealed in the findings from our results in terms of reduction in alliance instability, uncertainty, financial risk, infighting, goals discrepancy and incompatibility, while at the same time improving environmental information sharing, profit sharing and stability and port congestion. Similarly, the results of Caschili et al. (2014), Jacobsson (2018), Yang and Lim (2017), and Wibisono and Jittami (2015) confirm with our study that collaborative and cooperative strategic alliances are crucial to the logistics efficiency of container shipping and transport companies by forging strategic alliances that encourage the efficient and effective use of resources in which members may trust one another, work together and collaboratively open markets, maximise economies returns, share all costs and profit created at the end.

The findings also back up Chalermpong (2020), Ascencio et al. (2014), Balci et al. (2018), Rau and Spinler (2017) and Kittipong et al. (2013) results affirming that collaborative and cooperative strategic alliances are entirely harmonious, requiring alliance members to participate in teamwork to produce win-win outcomes that enhance logistics efficiency and effectiveness in container shipping and transport firms. With the advent of collaborative and cooperative partnerships in the industry, the efficiency and effectiveness of logistics operations and offering like transit time, on-time sailing, vessel space availability, congestion, concentration, ease of risk diversification and loss of cargoes in the container shipping and transport firms are gradually becoming the sector's competitive differentiator (Fawcett et al., 2012; Das, 2011; Slack et al., 2002; Agarwal et al., 2009; Merk and Teodoro, 2022; Zhou and Kim, 2020; Buer and Haass, 2016). The findings further accede with the investigation of Heaver et al. (2005), Musso et al. (2000), Wong et al. (2018) and Bahinipati et al. (2009) that collaborative and cooperative alliances in container shipping and transport firms promote logistics efficiency and effectiveness in terms of clear business philosophy and objective, as well as maintaining innovative attitude, creative ideas, goals actualisation, openness and developing new tactics to meet shippers and customers' expectations. Nevertheless, the work of Myhr and Spekman (2005), Mohammed et al. (2022), Merk and Teodoro (2022), Cairou and Guillotreau (2021), Chalermpong (2020), Maloni et al. (2016) and Lai et al. (2008) concurred with this empirical analysis that collaborative and cooperative alliances facilitate readiness for partners to pursue mutually compatible alliance goals rather than acting opportunistically, implying that collaborative and cooperative alliances will reduce fraud, substandard products and services, enhancing information sharing, giving partners

proper direction and adequate utilisation of critical resources. Finally, the findings indicate that collaborative and cooperative alliances enhanced the logistics performance of container shipping and transport firms logistics performance in terms of efficiency and effectiveness by reducing high uncertainty, distrust, infighting, and dishonesty while encouraging confidence, commitment, fair play and adherence to agreements, clear rules that reduce frequent conflicts since the actors live in harmony, goals are collaboratively and cooperatively set (Elena Yulia, 2021; Chiu and Wang, 2019; Elnaz et al., 2018; Zhou and Kim, 2020).

## **5 Theoretical and managerial implications**

In the conceptualisation of the study model offered in this analysis, the theoretical implications of theorising strategic alliances in container shipping and transport firms are based on the multiple regression models. The model takes into account a compelling argument for the contribution interface between strategic alliances and logistics performance of container shipping and transportation enterprises, which is dependent on the fit of the model. As a result, this study used multiple regressions to statistically establish the correlation existing between strategic alliances and logistics efficiency or performance of container shipping and freight companies. Our findings validated prior research findings, Das and Teng (1998), Lai et al. (2020), Wong et al. (2012), Chalermpong (2020), Chiu and Wang (2019), Hanane et al. (2021), Ma et al. (2020), Merk and Teodoro (2022), Zhou and Kim (2020), Elena and Yulia (2021), Mohammad et al. (2022), Elnaz et al. (2018) and various and Carious and Guillotreau (2021) that strategic alliances dimensions (collaborative and cooperative strategic alliances) used in this study has a significant relationship with logistics performance of container shipping and transport firms in terms of efficiency and effectiveness. The conclusions of these scholars' empirical evidence demonstrated that collaborative and cooperative strategic alliances can provide significant competencies that enable alliance partners to acquire critical resources, complementary skills or assets. The authors maintained that collaborative and cooperative strategic alliances can also facilitate access to new markets and provide opportunities for mutual convergence or harmony. From the reviewed pieces of literature and our empirical investigation, we noticed that collaborative and cooperative alliances encourage mutual forbearance, flexibility, honesty, integrity, openness, commitment and confidence that allows alliance partners in container shipping and transport firms to work together thereby enhancing their long-term logistics performance.

Managers are urged based on this study to form collaborative and cooperative strategic alliances that will improve logistics efficiency and effectiveness that can also overcome key drivers of delays, port congestion, disruptions, and minimisation of logistics costs and repositioning value of empty containers. Strategic alliance managers should encourage members to embrace a simpler standard solution based on designs and data models that have the prerequisite to yielding trust and commitment among participants. They must also pay attention to collaboration and cooperation through intelligent e-business networks which will provide flexibility, adaptability and elimination of waste of resources among alliance partners to enable them to succeed. Furthermore, strategic alliance managers in container shipping and transport enterprises must build collaborative and cooperative alliances based on mutual harmony, trust,

commitment, flexibility and electronically mediated communication that enhanced logistics efficiency and effectiveness. Similarly, we suggest that managers in container shipping and transport firms should take advantage of this research model and its findings to develop effective and efficient logistics performance that will improve their logistical service and operational performance in terms of schedule reliability, vessel sailing time, disruptions, profitability, timely transportation and distribution of goods. Finally, alliance managers in container shipping and transport firms should consider how participants in alliances can collaborate and cooperate in a variety of situations by establishing trust-based social foundations and employing technologically assisted communication. Logistics and alliance managers should utilise a system approach rather than evaluate internal company resources, teamwork, organisational culture, or intra firm connections with stakeholders independently in the light of the proposed new dimensions of strategic alliances. Additionally, logistics and alliance managers need to be aware of the strategic value of cooperative and collaborative alliances in creating powerful coalitions that improve logistics performance.

### *5.1 Limitations and future research*

The inability to account for the intervening effects of important factors such as type of corporation, size, and technological status adoption is limited by the data collection analysis limitations. These factors may be incorporated in a comparison model in a future study to account for their confounding effects. There is a scarcity of academic investigation on the role of strategic alliances in the logistics efficacy of container shipping and transport firms. The high level of apathy among respondents when it comes to vouching for information and disclosing company data or documents on alliances dynamics and logistics operations is another limitation. Future research should replicate this study in other industries and other countries since it was measured in container shipping and transport firms, and conducted in Nigeria where other countries' geographical factors and technology advancements were not taken into consideration. Also, there are various limitations to the interpretation of the study findings, which we will to future research to investigate.

### *5.2 Conclusions and recommendations*

The empirical results of the study's findings clearly underscored that collaborative and cooperative strategic alliances have a significant and positive relationship with logistics performance of container shipping and transport firms. The two alternate hypotheses put forth were all accepted, implying that logistics performance of container shipping and transport firms is significantly and positively impacted by collaborative and cooperative strategic alliances. Furthermore, the empirical results revealed that trust is at the heart of collaborative and cooperative strategic alliances' innovation capability in container shipping and transport firms' efficient and effective logistics performance. The findings show that cooperation, especially alliance partners' veracity, commitments and alignment of interest are considered in the investigation as crucial factors that fuelled collaborative and cooperative alliances' success in container shipping and transport firms' logistical enhancement. This finding explains that shipping operations and transportation in the logistics chain are crucial parts of economic development that promote industrial specialisation and scale economy, businesses rely significantly on logistics services to

conduct global commerce. Besides, the findings show the advantages of trust, veracity, commitment, openness, and flexibility in collaborative and cooperative alliances that result in improved exchange efficiency, which saves time and money, as well as reliable delivery of critical resources and timely access to important inputs in operations and the willingness to reject short-term alliance and logistics solutions. From the results, creating collaborative and cooperative connections between alliance partners in container shipping and transport firms requires communication and information exchange across firms to accomplish an effective and efficient supply chain that allow firms to save money, labour and improve operations while keeping close relationships with customers. The results further revealed that collaborative and cooperative strategic alliances in container shipping and transport firms also create a flexible supply chain capable of reacting to market fluctuations by promptly releasing intelligence with alliance partners. Nevertheless, we also discovered that collaborative and cooperative strategic alliances strengthen control mechanisms between alliance participants that generate a sense of confidence, and trust, acquire critical resources, and complementary skills, reduce distrust, and infighting, and enhance organisational capabilities that will result in improvement in logistics productivity in terms of logistics service reliability, service differentiation, vessel sailing time, reducing disruptions, port congestion, transportation delay and container shortage.

Based on these findings, we recommend that alliance managers in container shipping and transport firms should create an enabling environment for collaborative and cooperative tactics that will improve logistics efficiency and effectiveness by encouraging decisions made daily in container loading and unloading procedures. Managers should coordinate resource planning choices with the use of grounding solutions that improve container horizontal transit and have a positive impact on effective and efficient resource usage and higher customer service levels. We recommend further that managers in container shipping and transport firms should form collaborative and cooperative strategic alliances that will improve logistics service in terms of storage, order selection and transportation that will enhance customer satisfaction. Managers in container shipping and transport firms should also form collaborative and cooperative alliances that boost shipping businesses that can increase logistics efficiency and effectiveness by enhancing fleet utilisation, cost-effectiveness, profitability, customer services, client's satisfaction, on-time delivery, damage-free goods, assigning ships shipping service and fleet mix.

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## Appendix

### *Measurement items*

- Q1 Sex
- Q2 Age
- Q3 Education qualifications

### *Collaborative strategic alliances (rang: strongly agree - strongly disagree)*

- Q4 Strategic alliance that collaborates lessens the alliance participants' mistrust.
- Q5 Strategic alliance that are collaborative enhance logistics performance by maximizing alliance members profit, improve services, reliability, on – time sailing time and transportation delay.
- Q6 Collaborative strategic alliances eased confidence and mutual forbearance among members.
- Q7 Collaborative strategic alliances help parties to diversify their risk.
- Q8 Collaborative strategic alliances reduce the frequency with which one partner attempts to advance at the other's expense.
- Q9 Collaborative strategic alliances allow alliance members to have unique complementary resources and skills.
- Q10 Collaborative strategic alliances improve member's ability to coordinate their dependency.
- Q11 Collaborative strategic alliances promote strong relationships and cooperative decision making that prevents one – side decisions.
- Q12 Information on order histories and forecasts are shared publicly over the web through the help of collaborative strategic alliances.
- Q13 Flexibility, adaptability and waste elimination are encouraged through collaborative strategic alliances in a high-risk setting.

### *Cooperative strategic alliances (range: strongly agree - strongly disagree)*

- Q14 Cooperative strategic alliances increase logistics efficiency and effectiveness by promoting port– to land carrier's coordination, loading and uploading, process services quality, transit time schedule reliability and minimizing disruption effect.

- Q15 Cooperative strategic alliances must be built on the foundation of trust, confidence, commitment, veracity and mutual forbearance.
- Q16 Cooperative strategic alliances open up new markets and present chances for mutual convergence of harmony which improves the performance of logistics activities.
- Q17 Strategic alliances that cooperate give partners a direct access to the technology of the collaborators.
- Q18 Information sharing that enhances logistics services, fleet mix, logistics operations, inventory control, packaging and handling is facilitating by cooperative strategic alliances.
- Q19 Cooperative and collaborative strategic alliances will have reinforced control mechanisms that improve logistics performance in container shipping and transport firms.
- Q20 Strategic alliances that are cooperative and collaborative will decrease rivalry between alliance members.
- Q21 Cooperative strategic alliances promote goals and objectives that benefit both parties.
- Q22 Cooperative strategic alliances encouraged interdependence and enhanced conflict management resolution mechanisms.
- Q23 Strategic cooperative alliances encouraged unity, trust and confidence in alliance members that reduce infighting and strengthen logistical activities in container shipping and transport firms.

*Logistics performance (range: strongly agree – strongly disagree)*

- Q24 Alliance partners profit maximization, risk diversification, schedule reliability, economics of scale, shipper's and customer's satisfaction can be achieved through logistics efficiency and effectiveness.
- Q25 When container shipping and transport companies practice collaborative and cooperative strategic alliances, shippers and customers received better logistics services.
- Q26 Flexibility and adaptability in logistics order fulfilment is achievable through collaborative and cooperative alliances.
- Q27 In container shipping and transport firms, logistics efficiency and effectiveness improved transit time predictability and vessel sailing time.
- Q28 Effective and efficient logistics performance lower logistics costs, increase profitability and accurate transportation demand forecasting.

*Efficiency (range: strongly agree – strongly disagree)*

- Q29 Logistics efficiency encourages proper use of company's resources.

- Q30 Efficiency in logistics activities reduces port congestion and transportation accident.
- Q31 Logistics efficiency reduces operational risk in container shipping and transport firms.

*Effectiveness (range: strongly agree – strongly disagree)*

- Q32 Effective logistics reduces inventory and transportation expenses.
- Q33 Logistics effectiveness improved schedule consistency, service capabilities, service flexibility and value-added service.
- Q34 Effective logistics beats over transportation delay and damages of cargo.