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THE IMPACT OF SUSTAINABLE COLLABORATION ON THE BUSINESS PERFORMANCE OF TURKISH SHIPPING COMPANIES: THE ROLE OF LINKING STRATEGIES

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ABSTRACT

In light of the increasing pressures on the environment and the necessity of globalisation, it is imperative that maritime companies achieve sustainability goals. In this context, the establishment of collaborative relationships between firms constitutes a pivotal strategy for the attainment of competitive advantage. In particular, it is emphasised that financial, social, and structural linking strategies contribute to sustainable cooperation. The objective of this study is to investigate the impact of sustainable inter-firm collaboration on business performance in the maritime industry. The study is based on an analysis of survey results from 56 maritime firms in Türkiye employing the structural equation modelling method. The findings indicate that financial linking strategies have the most significant influence on sustainable cooperation, followed by social linking strategies. In contrast, structural linking strategies appear to exert relatively limited influence. Furthermore, the findings indicate that sustainable cooperation has a direct influence on business performance while indirectly contributing to financial performance through customer loyalty. This study proposes that maritime firms should prioritise financial and social linking strategies to gain a competitive advantage. Consequently, sustainable cooperation strategies emerge as a pivotal factor for long-term success in the maritime industry, positively affecting business performance.

Key Words: *Sustainability, Maritime Businesses, Maritime Management, Business Performance, Linking Strategies.*

JEL Codes*: M11, M13, M19.*

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1. INTRODUCTION

The forces of globalisation, technological advancements, and mounting environmental pressure are compelling companies operating in the maritime sector to pursue sustainability goals. Sustainability is a critical element for businesses aiming to achieve long-term success, entailing the consideration of environmental, social, and economic dimensions (Song et al., 2023). In the contemporary era, maritime companies not only develop strategies based on their own internal resources but also seek to gain a competitive advantage by collaborating with other companies (Kim et al., 2023). Recent statistics reveal that the maritime industry contributes approximately 2-3% of global CO2 emissions, leading to increased regulatory scrutiny, particularly with the IMO's commitment to halving emissions by 2050 compared to 2008 levels (IMO, 2023). Mention the International Maritime Organization's (IMO) strategy to reduce greenhouse gas emissions by at least 50% by 2050 compared to 2008 levels. This strategic approach places significant pressure on maritime companies to adopt cleaner technologies and operational practices (Koung et al., 2020). Discuss advancements in eco-friendly technologies such as wind-assisted propulsion, alternative fuels (e.g., hydrogen, LNG), and energy-efficient hull designs that are becoming increasingly integrated into maritime operations. These technologies have shown potential in reducing fuel consumption and emissions (Wang et al., 2024). In this context, inter-firm collaboration is a crucial factor in achieving sustainability goals.

The maritime sector plays an important role in global trade, but it also has a significant environmental impact (Tran et al., 2020). It is therefore incumbent upon maritime companies to comply with environmental standards and develop strategies that will enable them to achieve sustainability goals. Sustainable collaboration provides a crucial foundation for enhancing inter-firm relations and aligning actions with shared objectives (Henriquez et al., 2021).

Türkiye occupies a distinctive position as a significant maritime hub, largely due to its advantageous geographical location. The country is situated at a pivotal point for maritime trade with its numerous sea routes, including the Mediterranean, Aegean, and Black Sea, facilitating extensive commercial activity. Maritime companies operating in Türkiye are adopting sustainability strategies and fostering inter-firm collaboration in order to enhance their competitiveness in both the domestic market and the global arena. Table 1 presents an overview of selected maritime companies in Türkiye.

Table 1. General Information About Some Maritime Companies in Türkiye

Company name	Founding year	Number of employees	Main activity area
Arkas Holding	1948	6,000	Logistics, container transport
Turkon Shipping	1997	1,200	Container transport
Netlog Logistics	2002	5,000	Logistics, maritime transportation
Yıldırım Group	1963	3,500	Maritime, logistics
U.N. Ro-Ro	1994	900	Ro-Ro transportation

Source: Author.

Table 1 provides an overview of selected maritime companies in Türkiye, categorized by their primary areas of activity within the sector, such as logistics, container transport, and Ro-Ro transportation. These companies were selected based on their representation in various maritime subsectors and their prominent positions within the industry. This categorization not only highlights the diversity of operations in the Turkish maritime sector but also helps in understanding the contributions of different activity areas to sustainable practices.

The companies included in the table were chosen according to criteria such as their pioneering roles in the industry, reputable positions, employee numbers, rapid compliance with national and international regulations, and contributions to sustainability initiatives. Representing a small yet significant portion of Türkiye's leading maritime enterprises, these firms play a critical role in advancing international trade and promoting the sustainability of maritime transport. It is important to note that sustainability encompasses not only environmental but also social and economic dimensions. To achieve sustainable collaboration, companies should not only develop their internal resources but also strengthen their external relationships. Financial, social, and structural linking strategies are essential components that facilitate sustainable partnerships.

The existing literature indicates that inter-firm collaboration has a positive impact on customer loyalty, financial performance, and overall business performance. While collaborations facilitate the more efficient utilisation of resources, they also support the development of innovative solutions and the attainment of a competitive advantage (Goswani et al., 2023). In particular, financial linking strategies play an important role in ensuring sustainable collaboration by strengthening the relationships between firms (Gao and Erokhin, 2020).

This study aims to examine the effects of sustainable cooperation among maritime firms in Türkiye on business performance. To this end, it presents the results of a survey conducted among maritime firms in Türkiye. The contributions of financial, social, and structural linking strategies to collaboration processes and the effects of these collaborations on business performance are analysed using structural equation modelling (SEM). It is anticipated that this research will provide invaluable insight for maritime firms seeking to develop sustainable strategies and gain a competitive advantage.

The paper is structured as follows: Section 1 has presented a brief discussion of the significance of sustainable inter-firm collaboration and its implications for the maritime industry. Section 2 presents a review of the existing literature on sustainability and its implications for the maritime industry. Furthermore, it addresses prior research examining the impact of sustainable collaboration practices on customer satisfaction and loyalty. Section 3 provides a summary of the methodology employed in the study, with particular focus on the survey design and SEM. The results of the study are presented in Section 4, which details the effects of sustainable collaboration on business performance. Section 5 presents a discussion of the implications of these findings for industry practice. Section 6 concludes the

paper by presenting potential avenues for future research on sustainable collaboration in the maritime industry together with recommendations for further investigation.

2. LITERATURE REVIEW

This section presents a general framework of the concept of sustainability and emphasises its importance in the maritime sector. The main themes and findings in the existing literature on the environmental, economic, and social dimensions of sustainability and its application in the maritime industry are discussed. Furthermore, the literature on the impact of sustainable inter-firm collaboration on business performance in the maritime industry is reviewed and the contributions of these studies are emphasised. In particular, this section reviews the role of inter-firm alliances in achieving sustainability goals and the efforts of maritime firms to gain competitive advantage and increase customer loyalty. The objective here is to identify significant findings pertaining to the development and implementation of sustainability strategies within the maritime sector.

2.1. Relationship Between Sustainability and the Maritime Sector

The concept of sustainability encompasses a combination of environmental, social, and economic components, and it has become a critical factor for companies seeking to gain a competitive advantage (Senarak, 2020). In the context of the maritime sector, the concept of sustainability reflects the dual objectives of enhancing operational efficiency and curbing emissions from ships. This entails reducing energy consumption, minimising environmental impact, and optimising operational procedures (Li et al., 2022). Environmental sustainability is a central tenet of maritime companies' corporate strategies, with numerous studies demonstrating that such strategies enhance both financial and operational performance over the long term (Kim et al., 2022). Sustainability in the maritime sector involves not only reducing environmental impacts but also increasing operational efficiency. Within the scope of environmental sustainability, goals such as reducing greenhouse gas emissions, preventing marine pollution and integrating renewable energy sources stand out (Buonomano et al., 2023). Social sustainability aims to improve the welfare, safety and occupational health of maritime workers, while economic sustainability focuses on strategic investments to ensure the long-term financial stability of the industry (Boviatsis and Vlachos, 2022). IMO's regulations to reduce carbon intensity by 2023 and 2030 targets encourage companies to accelerate their sustainability efforts (IMO, 2023). An example of such sustainable practices is the maritime company Maersk, which incorporates biofuel-using ships into its operations to reduce its carbon footprint (Maersk, 2022).

2.2. Inter-firm Cooperation

Inter-firm collaboration represents a strategic approach designed to create synergies through the sharing of resources and the pursuit of common objectives. Resource dependence theory, as proposed by Ulrich and Barney (1984), posits that companies can obtain resources that they could not acquire

alone through collaborations, thereby gaining a competitive advantage. In the maritime industry, such collaborations are pursued in a wide range of areas, including supply chain management and the optimisation of operational processes (Hamann et al., 2023). Business-to-business cooperation is considered as a strategic way of sharing resources and achieving common goals. Resource dependence theory suggests that a company can be dependent on the resources offered by other companies and that these collaborations can provide competitive advantage (Camarinha-Matos et al., 2013). In the maritime industry, collaboration, especially in areas such as supply chain management, integration of logistics networks and information sharing, increases operational efficiency and reduces costs (Durvasula et al., 2000). Moreover, strategic alliances are also preferred to reduce risks and increase resilience to market uncertainties (Besson, 2018). The sustainability of these partnerships is important for the long-term success of companies and encourages co-investment and knowledge sharing in the industry. To illustrate how collaboration in the maritime industry has delivered tangible benefits in financial performance and market competitiveness, there is the example of collaboration between global firms such as COSCO and Maersk. This example will be instrumental in explaining the long-term success of inter-company cooperation and its widespread impact in the industry (Fanousse et al., 2021).

2.3. Linking strategies

A variety of linking strategies are employed with the objective of ensuring the sustainability of inter-firm collaborations and enhancing business performance. The relationship marketing framework proposed by Zhong et al. (2023) posits that financial, social, and structural ties serve to reinforce long-term collaboration between firms. Financial linking strategies entail the sharing of long-term financial interests between the parties involved, whereas social linking strategies prioritise the establishment of trust, commitment, and communication (Chen et al., 2022). Structural linking strategies involve the integration of the business processes and operational systems of different firms (Kanetsuna et al., 2021). Linking strategies use financial, social and structural ties to enable businesses to maintain sustainable business alliances. For example, financial linking strategies involve companies entering into agreements that protect their long-term financial interests (Chen et al., 2022). Social linking strategies strengthen cooperation by building trust, commitment and effective communication (Perrini et al., 2011). Structural linking strategies involve the integration of business processes and operational systems, which leads to operational alignment among business partners (Barnet and Salamon, 2006). These strategies also offer advantages such as risk sharing and increased resource efficiency. The co-investment agreements of major shipping companies such as COSCO and OOCL provide a concrete example of how financial ties can be effective in supporting long-term strategic goals (Hamann et al., 2023). In support of environmental sustainability goals, some shipping companies and ports have developed joint projects to increase the use of green energy. In such projects, bonding strategies are used, such as the adoption of specific standards for environmentally friendly operations and the sharing of financial investments. To

see the impact of various bonding strategies, companies such as Maersk and Hapag-Lloyd have sustainability-focused projects.

2.4. Effect of Sustainable Collaboration on Business Performance

A review of the literature reveals that the impact of sustainable collaborations on business performance has been a frequently examined topic. Fanausse et al. (2021) posited that external collaborations enhance companies' capacity for innovation and augment their financial performance over the long term. A review of studies conducted in the maritime sector further reveals that inter-firm collaborations facilitate the achievement of environmental goals and reduce costs by enhancing operational efficiency (Kanetsuna et al., 2021). The impact of sustainable collaborations on business performance is related to many factors such as innovation, cost advantages and customer satisfaction. External collaborations provide competitive advantage by increasing innovation capacity, which also contributes to financial performance (Fanausse et al., 2021). For example, collaborations in line with environmental sustainability goals help shipping companies to reduce emissions and thus comply with environmental regulations. Sustainability-oriented collaborations of large shipping companies such as Maersk and MSC have achieved significant results in reducing carbon emissions. These companies have achieved success in meeting environmental targets by increasing the use of environmentally friendly fuels in joint operational processes (Kim et al., 2022).

2.5. Relationship Between Sustainability and Business Performance in the Maritime Sector

For maritime companies, the relationship between sustainability and business performance is of paramount importance, particularly in terms of customer loyalty and competitive advantage (Ichimura et al., 2022). The objective of sustainability strategies is to meet customer expectations while simultaneously ensuring compliance with environmental regulations (Ghorbani et al., 2022). The available evidence indicates that sustainable collaborations have a positive effect on financial performance due to an increase in customer satisfaction. For instance, Chen (2021) suggests that sustainable business alliance practices exert considerable influence on customer loyalty and, consequently, on financial performance. The implementation of sustainability strategies not only serves to mitigate environmental impacts but also emerges as a pivotal element in the long-term success of businesses (Chen et al., 2022). The relationship between sustainability and business performance in the maritime industry can be addressed in many dimensions such as customer loyalty, regulatory compliance and competitive advantage. Sustainability strategies play a critical role to meet customer expectations and comply with environmental regulations (Ghorbani et al., 2022). Moreover, sustainable business strategies can contribute to financial performance by increasing customer loyalty. It has been observed that companies such as Maersk, which prefer ships that operate with environmentally friendly fuels, have established long-term business relationships by increasing customer loyalty. Such practices lead customers to prefer sustainable firms and positively affect financial performance (Ichimura et al., 2022).

An overview of relevant studies on sustainability in the maritime sector is provided in Table 2.

Table 2. Similar Studies in Literature

Author(s)	Year	Subject	Method	Finding(s)
Tran et al.	2020	Critical success factors for sustainable maritime management	Theory-based identification and sorting and AHP	Sustainability factors are critical to success; stakeholders' focus, intra-firm management, new technology acceptance, inter-firm collaboration, and strategic fit.
Fanousse et al.	2021	Reducing uncertainties in innovation projects	Systematic literature review	Three types of project uncertainties were found to be dominant in the context of innovation project management: task, technological and market uncertainties
Kanetsuna et al.	2021	To examine the role of information flows in enhancing the competitiveness of maritime clusters in Japan.	Questionnaire survey	Japan's ratings in maritime R&D and knowledge flows have been identified.
Henríquez et al.	2021	To examine the use of Distributed Ledger Technology (DLT) in the development of sustainable business models in the maritime industry.	Case study	He emphasizes that DLT will increase the traceability of activities in the maritime sector by providing a secure and unalterable system of records and will ensure trust among stakeholders.
Kim et al.	2022	To examine the impact of integration on operational performance in the container transportation supply chain.	Survey, SPSS 26, Amos 26	The existence of a mediation relationship in which Information Sharing mediates the effects of Supply Chain Indicator on Operational Performance has been identified.
Li et al.	2022	Buyer-supplier cooperation: macro and micro perspectives	Hierarchical regression	They find that when the inter-firm cooperation strategy and micro-level factors are aligned, there is an enhancement effect.
Zhong et al.	2023	Internal and external cooperation and supply chain performance	Polynomial regression and response surface	They emphasized the importance of balancing between internal constraints and external requirements.
Hamann-Lohmer et al.	2023	To examine the effects of digital transformation on the dynamics of relationships and collaboration in supply chains and production networks.	Multiple case studies, semi-structure interviews	It has been noted that digital tools have triggered a trend of centralization in internal networks, which increases efficiency but is met with stakeholder scepticism.
Kim et al.	2023	To examine the impact of supply chain integration on operational performance in container transportation.	Multivariate analysis of variance	The private cooperation and spirit of cooperation indices suggest that strong supply chain members resist two-way communication, reciprocity, distributive justice and long-term relationships.
Goswami et al.	2023	To develop a modelling and exploration framework to address intra-firm collaboration in the construction and mining equipment industry.	Scenario and subsequent sensitivity analysis	Using a cross-case analysis of five firms operating in India, they uncover a number of meaningful implications from both inter-organizational relations (IORs) and normative theory of organizations perspectives.

Source: Author.

The primary focus of shipping companies is the utilisation of internal resources and the implementation of internal strategies, such as the enhancement of operational processes, the reduction of costs, and the optimisation of internal efficiency. These strategies are employed with the objective of improving the overall performance of the business. Nevertheless, the subject of sustainable inter-firm cooperation in the form of strategic partnerships with other firms in the industry has not been sufficiently addressed in the existing literature. The impact of inter-firm linking strategies (financial, social, and structural) on sustainability and business performance remains an understudied area.

Studies conducted to address this gap have demonstrated that sustainable inter-firm alliances can contribute to positive outcomes in terms of business performance. However, there is a paucity of research in the maritime sector examining the engagement strategies through which these effects are realised. The present study aims to expand the existing literature by examining the effects of financial, social, and structural linking strategies on business performance in the maritime industry in greater depth.

3. METHODOLOGY

This study employs a quantitative research methodology to investigate the impact of sustainable collaboration among shipping companies on business performance. The study analyses the various strategic contextual effects (financial, social, and structural) of firm alliances and their direct and indirect effects on business performance. The research model was developed based on the findings of the existing literature and tested using SEM. The methodology is presented in detail in the following sub-sections.

3.1. Research Model and Hypothesis

The research model was developed with the aim of examining the effects on business performance of financial, social, and structural linking strategies that enable sustainable collaboration. The following hypotheses were proposed in this model:

H1: Financial linking strategies exert a positive influence on the sustainability of inter-firm collaboration.

H2: Social ties have a positive effect on the sustainability of inter-firm collaboration.

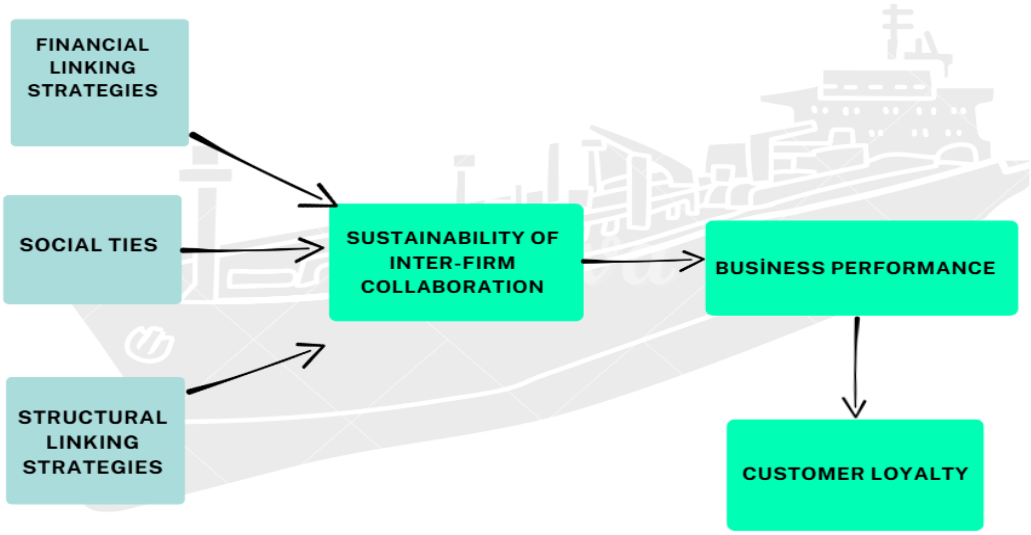
H3: Structural linking strategies have a positive effect on the sustainability of inter-firm collaboration.

H4: Sustainable inter-firm collaboration has a direct effect on business performance, specifically in relation to financial performance and customer loyalty.

H5: Sustainable inter-firm collaboration exerts an indirect effect on business performance via customer loyalty.

These hypotheses are based on the study by Zulu-Chisanga et al. (2021) and Shin et al. (2019). A visualized version of the research model is presented in Figure 1.

Figure 1. Research Model and Hypotheses



Source: Author.

3.2. Data Collection

The data for the study were gathered from companies operating in the maritime sector via the administration of a questionnaire. The questionnaire was based on the study of Zulu-Chisanga et al., (2021). The questionnaire was used by obtaining permission from the relevant authors via e-mail. The questionnaire included items relevant to the measurement of sustainable cooperation and business performance. The items were adapted from previous studies and were evaluated by the participants using a five-point Likert-type scale, with 1 representing strong disagreement and 5 representing strong agreement. In 2024, the questionnaire was distributed to 60 maritime company officials and 54 companies provided valid responses. The companies selected for inclusion in the study reflected a range of sizes and operational areas. Demographic characteristics of the surveyed companies are given in Table 3.

Table 3. Demographic Characteristics of the Surveyed Companies

Company Specifications	Category	Frequency	Percentage (%)
Ship type	Tanker	14	25.9
	Konteyner	18	33.3
	Dry/Bulk	16	29.7
	Ro-Ro	6	11.1
Number of ships	20 and over	25	46.3
	10-19	15	27.8
	1-9	14	25.9
Position	Manager	22	40.7

Company Specifications	Category	Frequency	Percentage (%)
	Senior Manager	12	22.2
	Operation manager	10	18.5
	Other (Specialist, Analiyst)	10	18.5
	0-5 year	15	27.8
Experience duration	6-10 year	18	33.3
	11+ year	21	38.9
	100 + employee	5	9.25
Number of company employees	50-99	23	42.5
	1-49	26	48.1

Source: Author.

3.3. Measurement Instruments

The measurement items employed in this study were designed using scales that had been previously validated in the literature. The measurement of financial linking strategies was conducted using four items, with an emphasis on long-term financial relationships and mutual benefits. The assessment of social linking strategies involved five items, including trust, commitment, and communication. Structural linking strategies were evaluated using four items that focused on the integration of operational processes and the utilisation of shared infrastructures. Business performance was evaluated in two principal domains: customer loyalty (five items) and financial performance (four items).

3.4. Data Analyses

The data were analysed using SEM, a robust statistical technique employed to examine the interconnections between intricate variables (Pering, 2020). This method allows for the simultaneous modelling of relationships between observable (e.g., survey questions) and unobservable (i.e., latent) variables. SEM is a particularly popular method in the social sciences, combining factor analysis and regression analysis for the elucidation of direct and indirect relationships (Muhtarom et al., 2022).

SEM plays an instrumental role in the evaluation of complex data structures, as it enables the simultaneous testing of measurement and structural models (Hair and Alamer, 2020). In the initial phase of this study, the questionnaire items to be utilised were evaluated for validity and reliability. To assess the validity of the data, confirmatory factor analysis (CFA) was employed to examine the factor loadings of each construct. Reliability analysis was conducted by calculating the Cronbach alpha coefficient, which is a widely employed method for assessing the consistency of survey items (Sin and Sin, 2020).

While these steps guaranteed the precision and dependability of the survey questions and the latent variables employed, the adaptability afforded by SEM ensured that the findings of the study would be more comprehensive and reliable (Albahri et al., 2021). Subsequently, the proposed structural model was evaluated using AMOS software (Collier, 2020). The relationships, coefficients, and significance

levels between the variables in the model were subjected to examination. Moreover, the mediating role of the customer loyalty variable was tested using the method proposed by Bagozzi and Yi (1988). The goodness of fit values of the model (x^2/d_f, RMSEA, CFI, and GFI) were analysed and the extent to which the proposed model was compatible with the data was evaluated (Zhang, 2022).

One of the most frequently employed techniques for numerical estimation of a model is the maximum likelihood (ML) estimation method (Kono and Sato, 2023). This method entails calculating the parameters of a model in order to achieve the optimal fit with the observed dataset.

The following formulae were used in the context of SEM (Harahap, 2020):

• $Y = \lambda\xi + \varepsilon$: Here, Y represents the observed variables, while λ represents the loading coefficients of the observed variables on the latent factors, ξ represents the latent constructs, and ε represents the error terms.

• $\xi = \beta\xi + \gamma\eta + \zeta$: This equation represents the structural model, where ξ denotes the latent variables, β and γ signify the regression coefficients, and ζ denotes the error terms.

4. FINDINGS

This section presents the results of SEM analyses conducted to test the relationships between sustainable cooperation and business performance among maritime firms. The findings clarify whether the proposed hypotheses are corroborated and the effects of disparate linking strategies on business performance.

4.1. Validity and Reliability of the Measurement Model

The initial step entailed ascertaining the validity of the scales through the utilisation of CFA. The factor loadings were found to be above 0.70, reflecting an acceptable level of significance. The model fit values were also found to be satisfactory, with a x^2/d_f value of 2.1, RMSEA value of 0.048, CFI value of 0.931, and GFI value of 0.912. These results demonstrated the validity and reliability of the scales employed. The Cronbach alpha values provided confirmation that all constructs were reliable, with alpha values of 0.87 for financial linking strategies, 0.89 for social linking strategies, 0.85 for structural linking strategies, and 0.91 for business performance.

4.2. Results of the Structural Model

The structural model was applied to examine the impact of financial, social, and structural linking strategies on the sustainability of inter-firm collaboration, as well as the direct and indirect consequences of such collaboration on business performance. The tested hypotheses were as follows:

1. H1: Impact of financial linking strategies on the sustainability of cooperative endeavours

   The results demonstrated that financial linking strategies exert a positive and statistically significant impact on sustainable cooperation ($\beta = 0.45$, $p < 0.01$). This finding suggests that financial relationships are a significant determinant of long-term cooperation and sustainability management.

2. H2: Effect of social linking strategies on sustainable cooperation

   The effect of social linking strategies on sustainable cooperation was also found to be positive and significant ($\beta = 0.31$, $p < 0.05$). The formation of social relationships, the establishment of trust, and the development of commitment are all effective means of fostering stronger and more enduring forms of collaboration between firms.

3. H3: Impact of structural linking strategies on sustainable cooperation

   The relationship between structural linking strategies and sustainable cooperation was not statistically significant ($\beta = 0.18$, $p > 0.05$). This suggests that the integration of operational processes exerts a comparatively limited influence on the nature of cooperation as compared to the influence of financial and social contexts.

4.3. Effects on Business Performance

4. H4: Direct effect of sustainable inter-firm collaboration on business performance

   The direct effect of sustainable collaboration on business performance (financial performance) was found to be positive and statistically significant ($\beta = 0.42$, $p < 0.01$). This suggests that collaboration plays a role in the overall financial success of a firm.

5. H5: Indirect effect on business performance through customer loyalty

   The effect of sustainable collaboration on customer loyalty was found to be positive and significant ($\beta = 0.38$, $p < 0.05$) and customer loyalty had a positive effect on financial performance ($\beta = 0.41$, $p < 0.01$). This suggests that the indirect effect of collaboration on financial performance is mediated by customer loyalty.

4.4. Support of the Hypotheses

The results obtained for the hypotheses explored in this study are provided in Table 4.

Table 4. Summary of Support for the Hypotheses

Hypotheses	Result
H1	Supported
H2	Supported
H3	Not supported
H4	Supported
H5	Supported

Source: Author.

5. DISCUSSION

This study has presented significant findings regarding the impact of sustainable inter-firm collaboration on business performance in the maritime industry. The findings indicate that financial and social linking strategies are the primary drivers of sustainable collaboration, with such collaboration exerting both direct and indirect effects on business performance. In this section, the relevance of these findings in the context of other studies in the literature and their implications for practices in the maritime industry are discussed.

5.1. Financial Linking Strategies and Sustainable Cooperation

The findings of this study indicate that financial linking strategies exert the most significant influence on sustainable cooperation. This is consistent with previous results reported in the literature. In particular, previous studies corroborate the assertion that long-term financial relationships and shared gains serve to reinforce inter-firm cooperation (Zhong et al., 2023). It is evident that the establishment of a financially sustainable structure fosters trust between firms, thereby facilitating long-term collaboration. Solesvik and Westhead (2010) emphasize the importance of partner selection criteria when forming financially linked strategic alliances in the maritime industry. They argue that firms should carefully consider both task-related and partner-related factors in order to develop fruitful collaborations. This is consistent with the findings of Song and Lee (2012), who posit that inter-organisational learning is an important strategic tool for enhancing operational efficiency and service effectiveness in maritime logistics. Furthermore, sustainable co-operation has been demonstrated to have a beneficial effect on financial performance, both directly and indirectly through customer loyalty. Tran et al. (2021) argue that shipping companies should develop sustainable capabilities through external collaborations to improve their business performance. This finding indicates that significant strategic measures can be implemented with regard to the sharing of costs and the distribution of risks within the maritime sector. As a suggestion under this heading, carbon emission reduction projects can be created in which two or more companies can invest together. In this way, firms can achieve cost savings while complying with environmental standards. Such projects not only offer financial advantages, but also contribute to environmental responsibility goals.

5.2. Social Linking Strategies and Strengthening Cooperation

The findings further indicate that social linking strategies exert considerable influence on the sustainability of collaborative endeavours. This reflects the crucial role of trust, commitment, and communication in collaborative processes. In the context of social capital theory, it has been demonstrated that the establishment of robust social relationships between firms enhances the sustainability of collaboration (Henriquez et al., 2021). For example, similar to the results in this study, Brito et al. (2014) found that social connection strategies with suppliers and customers have a positive impact on firm growth and profitability. In the same area of cooperation with competitors, Luo et al. (2007) and Jiang et al. (2010) found that alliances with competitors are positively related to financial performance. Morris et al. (2007) provided evidence that inter-firm social linkage enables cooperation to reduce risks and leverage resources. Therefore, the results in this study add to this body of knowledge by providing evidence that inter-firm social linkage strategies are beneficial for shipping company performance in an under-researched emerging economy context. In the maritime sector, it has been shown that social ties facilitate the sharing of knowledge, the resolution of problems, and the generation of new ideas. However, the observation that social linking strategies exert a comparatively weaker influence than financial linking strategies indicates that a more robust cooperation model could be developed by combining these two strategies. Given that social bonding strategies play a critical role in sustainable collaborations, maritime companies can undertake various initiatives to strengthen social ties in the sector. For example, joint training programs can increase knowledge sharing and contribute to addressing staff shortages in the sector.

5.3. Ineffectiveness of Structural Linking Strategies

The finding that structural linking strategies have no significant impact on sustainable cooperation is consistent with the results of previous studies in this field. In particular, structural strategies, such as the integration of operational processes and infrastructure sharing, are perceived to have a relatively limited impact in comparison to financial and social linking. This finding suggests that structural linking strategies serve a supplementary function in the cooperation process but are not a sufficient means of strengthening cooperation in isolation. The high costs and lengthy timescales associated with structural integration processes in the maritime sector may be contributing factors to the limited impact of these strategies. Zheng et al. (2010) identified structural linkage strategies as the lowest factor in mergers with coefficients of 0.11 and 0.12. In their study, culture and strategy criteria were found to be 0.71 and 0.21, respectively. Similarly, structural linkage has a low effect in this study. Digital platforms and cloud-based data sharing systems can be used instead of full integration in operational processes. Such technologies can contribute to fast decision-making processes by providing firms with easy access to information.

5.4. Effects of Collaboration on Business Performance

Among the principal findings of this study are the direct and indirect impacts of sustainable collaboration on business performance. This study has demonstrated that collaboration exerts a direct influence on financial performance as well as an indirect influence on financial performance through customer loyalty. This is consistent with the findings of previous studies in the literature that emphasise the importance of the relationship between collaboration and business performance (Tran et al., 2020; Chen et al., 2022). Wang and Archer (2004), and Zedtwitz and Gassmann (2002) found that the Collaboration factor had a stronger effect than other factors. It is evident that sustainable collaboration between maritime companies has a beneficial impact on both financial success and customer loyalty. In particular, the mediating role of customer loyalty allows companies to gain a competitive advantage and strengthen their market position over the long term. They can expand their environmentally conscious customer base by offering sustainability-oriented services. Shipping companies can increase customer satisfaction by reporting initiatives such as reducing carbon emissions or using green energy. Thus, customer loyalty can be achieved through sustainable collaborations and long-term competitive advantage can be gained.

5.5. Contributions to Theory and Practice

This study makes a significant contribution to the existing literature on sustainable collaboration strategies. The findings that financial and social linking strategies are the most effective factors in collaboration processes provide a new perspective on the theoretical discussions in this area. Moreover, the limited impact of structural linking strategies represents a significant avenue for further investigation in the literature. From a practical standpoint, it can be concluded that collaboration strategies for maritime companies should be meticulously planned. In order to reinforce collaboration, organisations should initially prioritise financial and social linking strategies and integrate them in a manner that will enhance customer loyalty. Moreover, structural linking strategies can be utilised as an ancillary element within collaborative processes. Nevertheless, it is crucial to acknowledge that they are not standalone solutions.

Theoretical Contributions: This study contributes to the debate on sustainable cooperation strategies by emphasizing the importance of financial and social binding strategies. In this context, it provides a new perspective to existing theories such as resource dependence theory and social capital theory. The finding that financial and social bonding strategies should be prioritized in collaboration processes suggests that shipping companies can achieve more sustainable and efficient results in collaboration processes by not only sharing resources but also building trust and social bonds. Furthermore, within the context of the corporate ecosystem theory, the limited impact of structural binding strategies was underlined, and it was stated that these strategies can only play a supportive role.

This opens up new research areas for future research to examine the role of structural strategies in more depth.

Practical Contributions: The findings of the study can guide maritime companies to plan their collaboration strategies more effectively. Considering the impact of financial and social bonding strategies on customer loyalty, maritime companies can increase operational efficiency by prioritizing these strategies. It is also emphasized that structural strategies should be used as a complementary element in the cooperation process and are not a sufficient solution on their own. In this context, it is important for maritime companies to structure their strategic planning according to these findings in order to increase customer satisfaction and gain competitive advantage in the sector.

5.6. Limitations and Future Work

It is important to acknowledge that the data collection process of this study was confined to maritime companies in Türkiye. Consequently, the results may not be entirely representative of the wider maritime industry. It would be beneficial for subsequent studies to conduct comparative analyses by collecting data from a range of countries and cultural contexts. Furthermore, it would be beneficial to conduct longitudinal studies in order to investigate long-term effects. Moreover, further comprehensive research is necessary to gain a deeper understanding of the impact of structural linking strategies.

6. CONCLUSION

This study has examined the impact of sustainable inter-firm collaboration in the maritime sector on business performance, with a particular focus on financial, social, and structural linking strategies. The findings indicate that financial and social linking strategies are pivotal elements of sustainable collaboration, whereas the impact of structural linking strategies on collaboration is comparatively constrained. Moreover, it was demonstrated that sustainable collaboration has a beneficial impact on financial performance, both directly and indirectly through customer loyalty.

One of this study's principal conclusions is that financial linking strategies constitute a crucial element in the collaborative processes between maritime firms. Financial strategies facilitate the establishment of long-term collaborations, enabling firms to simultaneously achieve their sustainability goals and enhance their financial success. Moreover, social linking strategies are also of considerable importance in enhancing collaboration. It is widely acknowledged that social relationships and trust are of paramount importance in the establishment of long-term and robust collaborations between firms.

In comparison to financial and social strategies, the impact of structural linking strategies on sustainable cooperation is less discernible. It is acknowledged that operational integration is an insufficient means of reinforcing cooperation. The long-term viability of maritime companies is enhanced by sustainable cooperation, which has a positive effect on their financial performance. Moreover, this favourable impact is augmented by the indirect contribution of customer loyalty. This

demonstrates the importance of collaboration between organisations in order to gain a competitive advantage.

It is recommended that companies in the maritime sector adopt financial and social linking strategies as a means of achieving sustainability goals and enhancing their business performance. The implementation of these strategies will serve to reinforce the collaborative efforts of the parties involved, thereby enhancing customer loyalty and ultimately bolstering the competitive advantage of the companies in question. It is recommended that structural linking strategies be regarded as supplementary elements and that they be deployed in conjunction with other strategies for optimal efficacy.

The findings of this study contribute to the current knowledge on the impacts of financial and social linking strategies on business performance. Nevertheless, further investigation is required to ascertain the potential for structural linking strategies to enhance collaboration. Further research could extend the present findings through comparative studies conducted in different countries and sectors, examining the ways in which collaboration strategies vary in different contexts.

In conclusion, it can be stated that the implementation of sustainable collaboration strategies among maritime companies has a positive effect on business performance when supported by financial and social strategies. This study highlights the strategic importance of collaboration among companies and offers invaluable theoretical and practical insights to the maritime sector.

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