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How to increase company loyalty: using relational variables and sustainable practices to segment the maritime transport sector

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ABSTRACT

Intense competition in goods transportation has highlighted the importance of understanding customers' interests in order to design successful relationship strategies. This study proposes, through a segmentation approach, to identify customer groups based on their perceptions of sustainable practices and relational variables about their main transport supplier. From a sample of 122 companies, a multiple correspondence analysis was carried out. The results show that there are three groups of customer companies, which correspond to a high, low, and medium relational and sustainability approach. The identified segments are also significantly different in terms of time of operation in the maritime sector, type of activity, size, and age. This proposal provides valuable information at the managerial level on the most influential attributes in the generation of loyalty in the B2B context of the maritime transport sector.

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1. Introduction

Maritime transport plays an especially important role in international trade as it is responsible for moving 80% of the world's cargo. In recent years, this sector has faced natural disasters and a global economic and health crisis caused by the COVID-19 pandemic, so there are institutional pressures to ensure that its operations comply with sustainability standards (UNCTAD., 2020).

Due to this dynamic and turbulent environment, the behaviour patterns of maritime service actors are changing rapidly. Currently, customers now tend towards concentration and prefer to contract all services with a single provider. In this work, the term 'customer' will refer to all those who receive services from shipping companies and this includes both freight forwarders and shippers.

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In this extraordinarily complex context, formed by an inter-organisational market of operators with different types of businesses and preferences (Balci & Cetin, 2017), it is important for the service provider to know the interests of its customers and to know if these beliefs are homogeneous or change according to the characteristics of these customers. This vision is essential in marketing to achieve the ultimate goal of the relationship, i.e. loyalty (Ruiz-Martínez et al., 2019). Freight forwarders, compared to shippers, are the customers that handle the highest volume. This makes them the main customers of shipping companies and therefore the target of the greatest efforts to be made to maintain the relationship (Shin et al., 2017).

Recent studies have indicated that customer loyalty can be increased through the implementation of sustainable practices (Jozef et al., 2019; Yuen et al., 2018). Sustainability is a concept that goes beyond mere environmental concern, although it is most commonly observed under this approach. Elkington (2004) defines sustainable practices under the expanded perspective included in the Triple Bottom Line (TBL) framework, which requires an extended vision based on three support pillars: social, environmental, and economic. However, the studies that have explored the attitudes of the customers of shipping companies towards these practices, from a TBL perspective, are limited; to our knowledge, in no case has TBL been used to support observation of the market from the recognition of its heterogeneity and in a context of relationships between companies. Shin et al. (2017) examined the impact of sustainable practices on customers, from the TBL perspective, but did not segment them. Meanwhile Van-den-Berg and De Langen (2017) compared perceptions about sustainability between two groups of customers, freight forwarders and shippers, but only considered the environmental aspects of sustainability.

Given the gap identified in the literature, we put forward the first research question:

> Research Question 1: Is it possible to segment the shipping companies based on their perceptions related to sustainability from a Triple Bottom Line framework?

In relation to management of the links that are established between service providers and customers, success lies in endeavours to construct a lasting relationship over time. It is necessary to apply criteria that allow us to know the perceptions, beliefs and attitudes of customers towards the service received (Moliner-Velázquez et al., 2014).

In a business-to-business relationship environment (hereinafter, B2B), value represents an important element (Gil-Saura et al., 2020), especially when the object of exchange is the service, and not the merchandise being transported. This service will only be perceived as successful and satisfactory if it meets customer requirements in terms of benefits and cost reduction. Some studies have also highlighted the direct relationship between perceived value and loyalty (Hänninen & Karjaluoto, 2017); however, this relationship is not uniform for all customers (Floh et al., 2014). Despite the different contributions to the literature on value in B2B relationships, the study by Gil-Saura et al. (2015) is among the few that have identified customer groups based on the perceived value of the service in the transportation sector. However, their results have not been conclusive.

Beyond value, the literature has also recognised the importance of satisfaction and long-term orientation as constructs that help explain customers' desire to continue with the relationship (Gil-Saura et al., 2018; Shin & Thai, 2016).

In line with previous studies (Fuentes-Blasco et al., 2017; Moliner-Velázquez et al., 2014), we consider that the variables linked to affective reinforcement will allow a better understanding of the attitudes of customer companies towards their service providers and their interest in continuing in the relationship. So we put forward the second research question:

> Research Question 2: Is it possible to identify segments of companies in the maritime sector using relational variables such as logistics value, satisfaction, and long-term orientation as a basis for segmentation?

Republic of Panama emerges as an excellent study field due to its evolution in international maritime transport. The Panama Canal links the Atlantic with the Pacific oceans, connecting 1,900 ports around the world, through 180 maritime routes. Despite the COVID-19 pandemic, the Panamanian maritime industry has obtained one of the best cargo movement −516,196 net tonnes CP/SUAB[1] in 2021-, representing an increase of 8.8% compared to 2020 (Georgia Tech Panama Logistics Innovation & Research Center, 2022). The health crisis has led to focus on sustainability requirements, which can be achieved through technological advances (UNCTAD., 2021). In his line, the Panama Canal Authority has framed a decarbonisation plan that includes actions to reduce the environmental impact and aims to achieve carbon neutrality by 2030 (ICEX España Exportación e Inversiones, 2021).

Therefore, this study seeks to analyse the capacity of sustainability dimensions (TBL) and relational variables to segment the market and thereby identify different customer groups. To achieve this purpose, the work is structured as follows. First, a review of the literature on key concepts is performed, then the methodology and the results achieved are described. Finally, the conclusions, limitations, and future lines of research are presented.

2. Theoretical framework

2.1. Sustainable practices

Sustainability in maritime transport has been considered as the efforts made by organisations to meet current needs without affecting the capabilities of future generations (Yuen et al., 2017). However, addressing sustainability in this sector is complex due to the number of actors that participate in it (e.g. ocean carriers, freight forwarders, land transport service providers). All stakeholders pressure shipping companies to comply with sustainability requirements (Tran et al., 2020); but it is the customers, following the imperative of mandatory compliance with institutional environmental regulations and the dictates of the companies' own strategies, who most influence the adoption of these practices (Chang & Danao, 2017). In addition, if there is any breach in sustainability aspects, the cargo owners will hold their shipping company responsible, these in turn being pressured by their customers (Jozef et al., 2019). In this

Table 1. Segmentation based on sustainability in inter-organizational contexts.

Author(s)	Objectives	Methodology	Measurement scales	Results
Žabkar et al. (2013)	Supplier segmentation. Supply-side perspective. Classify different groups of companies based on the managerial perception of the customers' environmental activeness and deterrents. Investigate which are the difference among these groups of companies and the environmental strategies, the motives for and the result of these.	Survey technique. Sample: 153. Profile of respondents: chief executive officers. Research area: manufacturing industry.	Scale: 1 to 5 points. Types of variables: unidimensional Perceived customers' environmental activeness and deterrents. N° items:6. Corporate environmental strategies statement. N° items: 6. Marketing environmental strategies statement. N° items: 5. Motives of environmental strategies. N° items: 4.	There are three groups of companies which are significantly differentiated by the perception of customers' eco characteristics as well as in theirs corporate and marketing environmental strategies and the motives and deterrents known as eco-believers, eco-disbelievers, eco-hampered companies. Eco-believers: includes companies with the highest level of perceived customers' environmental activeness and the lowest level of perceived customers' environmental deterrents. Eco-disbelievers: includes companies with the lowest level of perceived customers' environmental activeness and the average level of perceived customers' environmental deterrents. Eco-hampered: includes companies with the average level of perceived customers' environmental activeness and the highest level of perceived customers' environmental deterrents. There is significantly difference in their corporate and marketing environmental strategies, the motives and results of the strategies.
Mondéjar-Jiménez et al. (2015)	Supplier segmentation. Supply-side perspective. Identify groups of companies within the automotive industry that have different mechanisms driving their environmental proactivity when innovating.	Documental analysis. Sample: 233. Research area: automotive industry.	Types of variables: unidimensional. Data was retrieved from the Spanish Technological Innovation Panel (PITEC-2010). Marketing information sources. N° items: 3. Process orientation. N° items: 5.	Three groups of companies, called eco-balanced, eco-marketers and eco-blind, were identified according to how they interact with the market demand and how they take advantage of eco-innovation. Eco-balanced: firms are orientated towards the environment. Eco-marketers: firms are highly

(*continued*)

Table 1. Continued.

Author(s)	Objectives	Methodology	Measurement scales	Results
			Product orientation. N° items:5. Eco-orientation. N° items: 3.	influenced by market information sources. Eco-blinds: firms don't see the general path toward approaching environmental aspects.
Yang and Wong, (2016)	Supplier segmentation. Supply-side perspective. Segment firms based on their management practices orientation, and assessing the performance outcomes of different environmental strategy oriented groups.	Survey technique. Sample: 152 (liner shipping company, liner shipping agency, freight forwarder). Profile of respondents: managerial level Research area: maritime transport.	Likert scale: 1 to 5 points. Variable: environmental management practices. Type of variable: multidimensional -Environmental auditing. N° items: 4. -Environmental collaboration. N° items: 6. -Environmental purchasing. N° items: 3. -Environmental management commitment. N° items: 3. Variables to measure organizational performance. Types of variables: unidimensional -Financial, and non-financial performance. N° items:6. -Environmental performance: N° items: 4.	Three company groups with different environmental strategies were identified. Environmental commitment oriented firms possessed the best non-financial performance. Environmental collaboration oriented firms had the best financial performance. Environmental auditing and purchasing oriented firms exhibited the best environmental performance among the groups.
Bai et al. (2017)	Supplier segmentation. Demand-side perspective. Supplier segmentation using a supplier potential matrix to evaluate suppliers with respect to two dimensions, capabilities and willingness, with respect to environmental issues. Segmentation is done using a novel hybrid multi-criteria	Survey technique. Sample: 50 firms. Profile of respondents: buyers working at different business units within the company. Research area: chemical industry.	Scale: 1 to 5 points. Types of variables: unidimensional. Supplier capabilities. N° items:9. Willingness criteria: N° items:6.	Based on the capacities and ecological willingness of the suppliers, three groups are obtained: High category: These suppliers represent the most willing and capable suppliers to be or become green. Medium category: Suppliers in this segment have low capabilities, but high willingness. Low category: This segment is not completely homogenous, since some

(*continued*)

Table 1. Continued.

Author(s)	Objectives	Methodology	Measurement scales	Results
	methodology. It is used to evaluate the problem.			of the suppliers may be considered to have high capabilities and low willingness. These suppliers' capabilities are at the lower end of high capabilities suppliers.
Van-den-Berg and De Langen, (2017)	Demand segmentation. Demand-side perspective Explores the attitude of both shippers and forwarders towards environmental sustainability in the sourcing of transport services.	Survey technique. Sample: 148 (shippers and forwarders). Profile of respondents: the forwarders' respondents held a general or account management position and the shippers' respondents held a transport or logistics management position). Research area: maritime industry.	Category scale. Sustainable as company's target: -Answer options: yes, no or under construction. Customer's request for sustainable (transport) solutions: - Answer options: always, most of the times or never. Insight request by the customer on the impact of the supplied services on the environment: -Answer option: always, sometimes or never. Change on importance of sustainable logistics in the next five years. - Answer categories: importance will definitely increase, importance will probably increase, importance will probably not increase, and importance will definitely not increase	Shippers and forwarders consider environmental sustainability as an important topic. Smaller shippers are less likely to engage in sustainable purchasing than large shippers. Forwarders do not perceive environmental requests because their customer do not communicate these demands to them. Companies with sustainability as company target translate this more often into their procurement/service offering. There is a positive relation between demand for sustainable solutions and demanded insight on the environmental performance. Shippers and forwarders expect that the importance of sustainable logistics will increase.
Bask et al. (2018)	Supplier segmentation. Supply-side perspective. Evaluate the importance given to environmental sustainability by the shippers and the logistic	Survey and interview technique. Sample: survey (600 responses), interviews (15 LSP). Profile of respondents: CEOs, vice presidents of logistics, and	Types of variables: unidimensional. Internal GSCM. N° items: 5. External GSCM with customers. N° items: 6.	Firms were divided into three mutually exclusive groups: a low environmental proactivity group, an average environmental proactivity group and a high environmental proactivity group.

(*continued*)

Table 1. Continued.

Author(s)	Objectives	Methodology	Measurement scales	Results
	services providers (LSP). Group operators according to their perceptions on how their customers choose an operator.	logistics managers. Research area: Logistic and Transport.	Financial performance: N° items: 4. Carrier selection. N° items: 24. Environmental proactivity. N° items:1 *GSCM: green supply chain management.	It seems that environmentally proactive LSPs financially outperform their less active peers and have the highest mean values with respect to both internal GSCM practices and external GSCM practices with customers, followed by the average and low environmental proactivity groups. There are four groups identified according to their perceptions about how the shippers select carriers (the LSPs): 1) Low-price seeker 2) Low-price – Service-Quality seeker, 3) Quality seeker, and 4) Environmentally orientated. The results also show that all other selection criteria (cost, quality, service and IT) have higher means than environmental criteria in every LSP group. Environmental sustainability acts more as an order qualifier than as an order winner in the carrier selection process. Carriers cannot easily differentiate their offerings by using environmental criteria. Environmental sustainability can be integrated into operational performance and cost indicators.

Source: arranged by the authors.

way, each element of the supply chain urges its service provider to act (Bask et al., 2018).

At the industrial level, some studies (Mondéjar-Jiménez et al., 2015; Yang & Wong, 2016; Žabkar et al., 2013) have used sustainability as a segmentation criterion under a supply-focused approach (Table 1). Only the study by Van-den-Berg and De Langen (2017) analyses customers groups in relation to sustainability from demand, whilst supporting the analysis on environmental criteria. The literature review shown in Table 1 corroborates the assertions of Vural et al. (2021) and Chang and Danao (2017) by observing a predominance of research in sustainability driven by the environmental perspective.

Extending sustainability beyond this approach, and under the expanded vision of the TBL, some argue that economic practices should be excluded in sustainability analyses because they are based on the benefit of companies (Yuen et al., 2017). Other positions indicate that the economic dimension indirectly benefits the community and contributes to the generation of customer satisfaction and loyalty (Shin et al., 2017). In addition, according to the stakeholder approach, the economic performance of shipping companies is conditioned by the pressures that these parties exert, due to the fact that the shipping companies depend on them to continue their operations (Tran et al., 2020). Therefore, a comprehensive approach to sustainability should contemplate a multidimensional perspective.

Next, we describe each of the dimensions that comprise sustainability practices under the proposed TBL approach.

2.1.1. Social practices and activities

The social dimension of the TBL is the least studied dimension (Vural et al., 2021). It includes safety, health, employment and working conditions (Psaraftis, 2019). The hiring of cheap labour and risky working conditions has attracted the attention of researchers, with the safety aspect being the most studied area (Vural et al., 2021). This dimension also includes the education of workers and cooperation with the community (Shin et al., 2017). According to Yuen et al. (2018), the participation of shipping companies in social activities generates trust through perceived value, thereby promoting loyalty. From the stakeholder perspective, Tran et al. (2020) indicated that shipping companies must satisfy the needs of society through altruistic behaviours. In addition, this would help to improve their projection and support in society. However, the study by Shin et al. (2017) concludes that the relationship between social activities and satisfaction was not significant.

2.1.2. Economic practices and activities

Evaluating the economic performance of a company is to take into consideration the ability to reduce costs associated with purchases, energy consumption, and operating costs, and thereby contribute to the company's profitability (Fernando et al., 2019). The availability of economic resources will also open up access to new markets and allow greater connectivity (Psaraftis, 2019). Failure to comply with these aspects in an adequate manner could result in increased costs, long delays, limited access, and distrust of the service. Based on the transaction cost theory, Yuen et al. (2018) indicated

that minimisation of the total cost (information search, negotiation, and execution) contributes to the generation of customer loyalty. This is consistent with the study by Shin et al. (2017) linking economic activities with customer satisfaction and loyalty.

2.1.3. Environmental practices and activities

Environmental aspects revolve around atmospheric emissions, waste control, spills, impacts of climate change, loss of biodiversity, etc. The main atmospheric pollutants are sulphur oxide (SOx), nitrogen oxide (NOx), particulate matter (PM), and carbon dioxide CO2 (Psaraftis, 2019). To cope with these environmental impacts, shipping companies have started to use eco-friendly ships that will simultaneously reduce operational costs (Chang & Danao, 2017; Yuen et al., 2017). Previous studies indicate that minimising documentation and shipping materials and the use of eco-friendly equipment contribute to the generation of customer loyalty (Jozef et al., 2019). Along the same lines, when concern for the environment is demonstrated by shipping companies, this generates satisfaction (Shin et al., 2017) and, through perceived value, trust (Yuen et al., 2018), thus fostering closer ties with customers.

2.1.4. Logistics value

As maritime transport is a service, value represents a necessary variable for the continuity of the relationship between service provider and customer (Gil-Saura et al., 2020; Hänninen & Karjaluoto, 2017).

Recent logistics studies have analysed value (Gil-Saura et al., 2018; Kim & Kim, 2020; Lin et al., 2021) and have defined logistics value as the fulfilment of customer requirements while minimising supply chain costs and maximising the benefits of the relationships in this chain (Rutner & Langley, 2000). Given the intangible nature of value, logistics value can be analysed from the perspective of perceived value (Gil-Saura et al., 2010). According to Novack et al. (1995), logistics value is achieved when the logistics service meets the customer's requirements, and they recognise that these requirements have been met, in terms of benefits and costs. In addition, analysing the service through the value perspective also implies knowing which attributes of this service influence the generation of value. In the maritime transport sector, Kim and Kim (2020) indicated that competitive pricing and service experience determine the perceived value. Along the same lines, the studies by Gil-Saura et al. (2010, 2018) concluded that one of the best predictors of logistics value is the quality of service. Furthermore, perceived value in the context of logistics leads to the generation of satisfaction (Gil-Saura et al., 2010; Kim & Kim, 2020) and loyalty (Yuen et al., 2018) that is reflected through purchase intentions (Lin et al., 2021). Therefore, providers must ensure that their customer companies perceive the value they offer at all times. In a study of the short-sea shipping service, Lin et al. (2021) concluded that freight forwarders pay for a transportation service based on the perceived value. However, different customers attribute different values to the same service. This indicates that shipping companies must connect their customers' service preferences with the fulfilment of their perception of value (Kim & Kim, 2020). In order to better understand customer requirements, some studies in the B2B context have used value as a basis for segmentation. In the financial and telecommunications sectors, Floh et al. (2014)

segmented customers based on perceived value from a multidimensional approach. In the tourism industry, Fuentes-Blasco et al. (2017) verified the usefulness of the value of the relationship to identify heterogeneous groups of customers. Lastly, Gil-Saura et al. (2015) segmented freight forwarders into two groups, based on the perceived value of the service their customers receive.

2.1.5. Satisfaction

In B2B relationship context, satisfaction is achieved when one company favourably evaluates its relationship with the other, making it a key survival factor (Caliskan & Esmer, 2020). Some studies have identified the main drivers of satisfaction in the maritime sector. Among them, Gil-Saura et al. (2018), in the relationship between freight forwarders and service providers, identified that the quality of the service and the perceived value influence the generation of satisfaction. Yuen and Thai (2015) concluded that customers show greater satisfaction with time-related aspects of the services rather than the price of the service. Shin et al. (2017) indicated that there is a positive link between customers' perceptions regarding sustainability and satisfaction. In addition, satisfaction plays an important role as a driver of customer loyalty within inter-organisational relationships (Moliner-Velázquez et al., 2014; Ruiz-Martínez et al., 2019). For example, Ruiz-Martínez et al. (2019) confirmed a positive effect of relationship value on satisfaction and the mediated effect of satisfaction on loyalty towards the company in the retail context. According to our theoretical framework, the authors establish satisfaction and loyalty as consequences of perceptions of value. However, our aim is not to confirm the causal relationships, but rather to verify how these relational variables help to identify segments of companies with different levels of loyalty.

2.1.6. Long-term orientation

Moliner-Velazquez et al. (2014) consider long-term orientation as a key construct for the continuity of the B2B relationship. In our study context, in line with Shin and Thai (2016), long-term orientation includes the amount of time that customers expect the relationship with their maritime service provider company to last. Some studies have indicated that long-term orientation influences the generation of value in the relationship (Moliner-Velazquez et al., 2014) and in the commitment and loyalty with the service provider (Gil-Saura et al., 2010). Furthermore, customer satisfaction positively influences long-term loyalty (Shin & Thai, 2016). This loyalty towards its main service provider is materialised through repeat purchases and recommendation of the shipping company to other companies (Shin et al., 2017), and can be expressed in terms of the aforementioned long-term orientation.

3. Methodology

3.1. Measurement scales and data collection

In order to answer the research questions empirically, quantitative research was carried out using a structured questionnaire targeted at personnel responsible for hiring the shipping company for the maritime transport service. The sample included

shippers -importers, exporters and re-exporters- and freight forwarders at a managerial level of the Republic of Panama. Panama's maritime business is undergoing major transformations as a result of multiple factors such as China's growing economic and political power and competition between the US and China, as well as the long-term impacts of COVID-19, climate change, and technological trends (CSIS. , 2021). The companies interviewed are active in this channel, which operates under a continuous work scheme 24 hours a day, every day of the year. According to the most recent data, in 2020, 255,733,585 tonnes of cargo were moved, representing an increase of 1.32% compared to the previous year and the highest figure since 2010 (MEEM, 2021). In addition, the wide range of goods transported through this channel is remarkable compared to other routes -from basic products and consumables, to manufactured and high-tech goods- (Georgia Tech Panama Logistics Innovation & Research Center, 2022).

In relation to the measurement scales used, sustainable practices and activities were measured using 14 items adapted from the proposal by Shin et al. (2017) to collect perceptions on economic, social, and environmental sustainability. Logistics value was measured through 7 items adapted from the proposal of Gil-Saura et al. (2010). Satisfaction was measured using three items, and long-term orientation was evaluated using four items, being both scales adapted from Shin et al. (2017). The adapted items included in the definitive survey are shown in Table 2. All items were measured with a 7-point Likert scale in which the respondent had to rate their degree of agreement with the proposed statements (from 1: 'strongly disagree' to 7: 'strongly agree').

Following the field work carried out between the months of October 2019 and February 2020, 122 valid and complete responses were obtained, reaching a response rate of 53.8%. The main characteristics of the sample are collected in Table 3.

3.2. Dimensionality and validity of the measurement scales

An exploratory factor analysis with Varimax rotation was estimated to evaluate the dimensionality of the measurement scales. In relation to sustainability, the results showed two groups of items: one that encompasses economic and social practices and activities, and one that encompasses environmental ones. The items proposed for the rest of the scales loaded their corresponding factor, which was one-dimensional. Dimensionality was confirmed with the estimation of a first-order measurement model, using robust ML. The results indicated the internal consistency of the measurement scales (see Table 4), showing levels of reliability (α and CR > 0.7) above the minimum thresholds required. With regard to the validity of the measurement scales, our scales met Fornell and Larcker's criteria (1981) since the square root of the AVE of each latent construct is higher than the correlation between constructs (see Table 4). Furthermore, the χ^2 difference test between the restricted model with correlations at 1 and the estimate of the unrestricted model (Anderson & Gerbing, 1988) was significant at 99% ($\chi^2(df = 38)=70.80$; p-value $= 0.000975$). These results verify the discriminant validity of the measurement scales. On the other hand, the convergent validity was verified according to Steenkamp and van Trijp (1991), since all the factor loadings exceeded 0.7 and were significant to its factor (see Table 5).

Table 2. Items used to measure, sustainable practices, logistic value, satisfaction and long–term orientation.

Dimension	Items
Economic sustainability practices and activities	**ECO1**. My main shipping company's economic activities contribute to the economic growth of the society to which it belongs.
	ECO2. My main shipping company expands its fleet by ordering new ships.
	ECO3.My main shipping company is growing its sales or market share through introducing innovation in management.
	ECO4.My company applies high standards for disclosure, accounting, auditing, and social and environmental reporting
Social sustainability practices and activities	**SOC1**.My main shipping company encourages cooperation with regional communities and educational institutions
	SOC2.My main shipping company carries out its corporate social responsibility in proportion to its sales
	SOC3.My main shipping company supports additional education for its staffs.
	SOC4.My main shipping company encourages its staffs to involve in the voluntary activities in the community.
	SOC5.My company donates to charitable organization.
Environmental sustainability practices and activities	**ENV1**..My main shipping company reduces CO2 emissions by slow steaming of its fleet.
	ENV2. My main shipping company suitably manages ballast water to protect the oceans from environment pollutions.
	ENV3. My main shipping company pays much attention environment protection.
	ENV4. My company uses environmental-friendly materials and equipment (e.g. nontoxic paint, electric deck machine, ballast water system).
	ENV5. My company adopts environmental-friendly shipbuilding designs (e.g. improved engine design and waste heat recovery systems).
Logistic Value	**LOVAL1.** Achieving productivity through quality logistics service is critical to the success of our business.
	LOVAL2. We are constantly trying to increase the level of global logistics service.
	LOVAL3. The top management of the company is aware of the impact on sales of changes in the level of logistics service.
	LOVAL4. We measure and quantify the elements of the logistics service.
	LOVAL5. We can express the value of logistics quality measurements in dollars.
	LOVAL6. The top management of the company is aware of the cost implications of changes in the logistics service.
	LOVAL7. For our clients, logistics adds value to our company and provides it with a competitive advantage.
Satisfaction	**SAT1.** I am satisfied with the communication with my main shipping company.
	SAT2. I am satisfied with the customer relationship management of the shipping company
	SAT3.I am satisfied with the service quality (route, schedule, freight rate, etc.) of the shipping company
Long-Term Orientation	**LT-ORI1.** I will recommend the services of my main shipping company to other companies.
	LT-ORI2. I will deliver positive word of mouth about the service of my main shipping company to other companies.
	LT-ORI3. It is beneficial to keep the trade connection with my main shipping company.
	LT-ORI4. I will extend or renew the contract with my main shipping company in the future

Source: arranged by the authors.

Table 3. Sample profile.

Activity		Firm age		Firm size	
Exporter	13.1%	1-5 years	26.2%	≤25 employees	43.4%
Importer	24.6%	6-10 years	32.8%	26-50 employees	32.0%
Re-exporters	8.2%	11-15 years	11.5%	>50 employees	24.6%
Freight forwarders	54.1%	16-20 years	7.4%		
		>20 years	22.1%		
Activity*		Length of patronage with the main shipping company			
Logistics	67.9%	<1 year			4.1%
Transport	59.3%	1-4 years			41.8%
Warehousing	57.1%	5-9 years			28.7%
Distribution	50.0%	≥ 10 years			25.4%
Commercial customer	14.3%				

*: *multiple* response.
Source: authors own estimations.

Table 4. Descriptive statistics, internal consistency, and measurement scale correlations.

	Mean	SD	α	CR	AVE	1.*	2.	3.	4.	5.
1. Economic & Social sustainability practices	5.48	1.01	0.912	0.929	0.595	*0.772*				
2. Environmental sustainability practices	5.27	1.16	0.909	0.933	0.736	0.706	*0.858*			
3. Logistic Value	5.91	0.92	0.924	0.940	0.691	0.636	0.549	*0.831*		
4. Satisfaction	5.90	1.04	0.902	0.939	0.837	0.546	0.495	0.576	*0.915*	
5. Long-term orientation	6.04	1.03	0.929	0.948	0.821	0.609	0.498	0.595	0.883	*0.906*

SD: standard deviation; α: Cronbach's Alpha; CR: composite reliability; AVE: average variance extracted.
*: *Values along the main diagonal show the square root of the AVE. Values below the diagonal represent the correlations between latent constructs.*
Source: authors own estimations.

4. Results

A segmentation analysis was carried out under the tandem approach, executing a multiple correspondence analysis within the multidimensional scaling techniques and a subsequent classification analysis based on the factor scores obtained. The results will allow us to observe both the typology and positioning of the companies using the maritime transport service based on perceptions of their preferred shipping company, as well as the interrelationships between these perceptions.

In the execution of the multiple correspondence analysis, the dimensions of sustainable practices and activities of an economic and social nature, those of an environmental nature, as well as logistics value, satisfaction, and long-term relationship were used as active variables. Given its specific nature, it was also chosen to include the time of relationship with the main shipping company. All the variables were recoded according to their 33% and 66% percentiles, obtaining three categories for each one of them -low, medium, and high level-. To complete the analysis, three variables of characterisation of the customer companies were included as supplementary variables: type of business, age of the company, and size (Table 6).

The first two axes of the multiple correspondence analysis explain 74.67% of the variability or contribution to inertia (44.48%+30.19%), presenting an associated eigenvalue greater than one (2.67 and 1.81 respectively). The interpretation will be limited to these two dimensions since the quantity explained is sufficient in this type of factor methods, when the following dimension does not provide a significant explanation (Gifi, 1990). The contribution of the active variables to the formation of the axes is analysed from the discriminating measures collected in Table 7. According

Table 5. Factor loadings and fit of measurement model estimation.

Dimension	Items	SL (t-value)
Economic and social sustainability practices and activities	ECO1	*0.705*
	ECO2	0.613** (5.36)
	ECO3	0.772** (6.47)
	ECO4	0.686** (5.49)
	SOC1	0.748** (5.98)
	SOC2	0.826** (6.77)
	SOC3	0.753** (6.17)
	SOC4	0.800** (5.57)
	SOC5	0.727** (6.00)
Environmental sustainability practices and activities	ENV1	*0.828*
	ENV2	0.837** (13.49)
	ENV3	0.775** (9.02)
	ENV4	0.816** (13.03)
	ENV5	0.854** (14.95)
Logistic Value	LOVAL1	*0.779*
	LOVAL2	0.848** (15.64)
	LOVAL3	0.794** (12.26)
	LOVAL4	0.844** (14.69)
	LOVAL5	0.758** (10.69)
	LOVAL6	0.804** (12.29)
	LOVAL7	0.793** (11.80)
Satisfaction	SAT1	*0.885*
	SAT2	0.867** (11.54)
	SAT3	0.879** (10.81)
Long-Term Orientation	LT-ORI1	*0.931*
	LT-ORI2	0.911** (30.17)
	LT-ORI3	0.789** (5.60)
	LT-ORI4	0.864** (10.88)

Fit indexes: $\chi^2_{Sat\text{-}B}(df = 340) = 466.96$ (p-value = 0.000); $\chi^2_{Sat\text{-}B}/df = 1.37$; RMSEA = 0.057; CFI = 0.881; GFI = 0.868.
SL: Standardized loadings.
**:*p-value* < *0.001*.
Source: authors own estimations.

to these results, the variables related to sustainable practices and activities, and the perception of logistics value clearly contribute to the formation of the first axis, while the variables associated with the relationship (satisfaction with the relationship, long-term orientation, and duration of the relationship) do so with the second axis.

To fully explain the most discriminating categories for each axis, we will rely on the positioning map shown in Figure 1. A hierarchical cluster analysis was also carried out on the factor scores of axes 1 and 2, with the aim of providing an adequate identification of the associations between categories of the variables, and, therefore, of the groups of companies (see Appendix). Three groups of associations indicated in Figure 1 were identified. After classifying the companies in each of these segments, various bivariate statistical tests (one-way ANOVA and contingency tables) were performed to clarify the description of the segments. The main characteristics of the segments are shown in Table 7.

The first segment is made up of 51 companies, whose defining characteristics are located on the positive semi-axis of the two axes, grouping the categories of average values of the relational variables (logistics value: 5.96; satisfaction: 5.90; long-term orientation: 6.01), and sustainable socio-economic (5.71) and environmental (5.47) practices and activities. Their means achieved are significantly higher than those demonstrated by the companies in segment 3 (Table 5). This group is characterised by

Table 6. Categories for MCA (active and supplementary variables).

Variable	Role	Categories	Label in Fig. 1
Economic & Social sustainability practices	Active	Economic + social: low level (<5.22)	ECOSOClow
		Economic + social: medium level (5.22-6.29)	ECOSOCmed
		Economic + social: high level (>6.29)	ECOSOChigh
Environmental sustainability practices	Active	Environmental low (<4.8)	ENVIROlow
		Environmental medium (4.8-5.8)	ENVIROmed
		Environmental high (>5.8)	ENVIROhigh
Logistic Value	Active	Logistic Value low (5.71)	LOVALlow
		Logistic Value medium (5.71-6.29)	LOVALmed
		Logistic Value high (>6.29)	LOVALhigh
Satisfaction	Active	Satisfaction low (5.67)	SATlow
		Satisfaction medium (5.67-6.33)	SATmed
		Satisfaction high (>6.33)	SAThigh
Long-term orientation	Active	Long-term orientation low (<5.75)	LPORIlow
		Long-term orientation medium (5.75-6.5)	LPORImed
		Long-term orientation high (>6.5)	LPORIhigh
Length of patronage with the main shipping company	Active	<1 year	Length <1 y
		1-4 years	Length 1-4 ys
		5-9 years	Length 5-9 ys
		≥ 10 years	Length >=10 ys
Business	Supplementary	Exporter	Exporter
		Importer	Importer
		Forwarding Agent	Forwarding Agent
		Re-exporter	Other
Firm Age	Supplementary	1-5 years	Age 1-5 ys
		6-10 years	Age 6-10 ys
		11-15 years	Age 11-15 ys
		16-20 years	Age 16-20 ys
		>20 years	Age >20 ys
Firm Size	Supplementary	1-25 employees	Size <=25
		26-50 employees	Size 26-50
		>50 employees	Size >50

Source: arranged by the authors.

being smaller companies (≤25 employees) with an age of 6-10 years and having a long-term relationship with its main shipping company (between 5 and 9 years).

The second group, made up of 41 companies, presents significantly higher average values than the other segments, especially in regard to the relational variables (logistics value: 6.42; satisfaction: 6.51; long-term orientation: 6.67). These are older companies (trading for more than 20 years), and 70.7% of the companies grouped in this segment are freights forwarders.

Finally, the third segment is the smallest, made up of 30 companies (24.6% of the sample). It shows average values significantly lower than the rest, especially in the perception of sustainable socio-economic (4.20) and environmental (3.87) practices, 40% of the companies that make up this group are importers and are particularly notable for being young companies (1-5 years old) and larger (more than 50 employees).

5. Discussion and conclusion

5.1. Discussion and theoretical implications

This work has focused on the perceptions of customer companies, shippers and freight forwarders, in relation to the transport service provided by their main

Table 7. Discrimination measures for active/supplementary variables and segments profile.

Variable	Dimension 1	Dimension 2	Mean	Segment 1 n = 51	Segment 2 n = 41	Segment 3 n = 30	Difference between segments
Economic & Social sustainability practices	**0.588**	0.132	0.360	5.71 (±0.56)	6.11 (±0.57)	4.20 (±0.96)	[b]F = 73.05** 1-2; 2-3; 1-3
Environmental sustainability practices	**0.548**	0.140	0.344	5.47 (±0.62)	6.06 (±0.90)	3.87 (±0.92)	[b]F = 67.25** 1-2; 2-3; 1-3
Logistic Value	**0.459**	0.311	0.385	5.96 (±0.50)	6.42 (±0.40)	5.14 (±1.38)	[b]F = 22.83** 1-2; 2-3; 1-3
Satisfaction	0.467	**0.480**	0.474	5.90 (±0.40)	6.51 (±0.57)	5.07 (±1.59)	[b]F = 22.81** 1-2; 2-3; 1-3
Long-term relationship	0.469	**0.582**	0.526	6.01 (±0.49)	6.67 (±0.53)	5.23 (±1.54)	[b]F = 23.47** 1-2; 2-3; 1-3
Length of patronage with the main shipping company	0.137	**0.166**	0.151	5-9 ys (37.3%)	1-4 ys (31.7%)	≥10 ys (50.0%)	χ^2(df = 6)=29.47**
Business[a]	*0.179*	*0.031*	*0.105*		Freight forwarders (70.7%)	Importer (40.0%)	χ^2(df = 6)=21.74**
Firm age[a]	*0.070*	*0.096*	*0.083*	6-10 ys (45.1%)	>20 ys (29.3%)	1-5 ys (33.3%)	χ^2(df = 8)=16.75*
Firm size[a]	*0.025*	*0.037*	*0.031*	≤25 empl.		>50 empl.	χ^2(df = 4)=7.37

[a]In Italics discrimination measures of supplementary variables.
[b]The Tukey-b post-hoc test was used to verify the existence of significant differences between the three segments.
*Significant differences between groups at the 95%, **: at the 99%.
Source: authors own estimations.

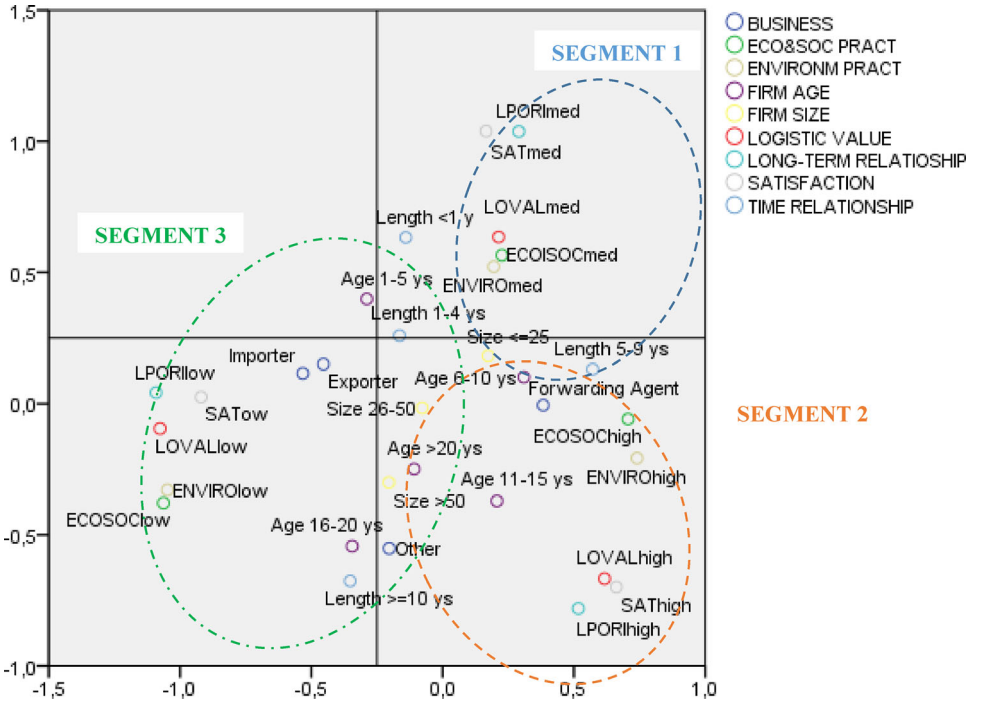

Figure 1. Positioning map of multiple correspondence analysis.
Source: authors own estimations.

transportation provider. The most relevant conclusions obtained in this research that contribute to the relationship marketing and maritime transport literature are detailed below.

This study has demonstrated the usefulness of relational variables (logistics value, satisfaction, and long-term orientation) and of sustainable practices (socio-economic and environmental), to identify customer groups in the maritime sector. The results have indicated that the relational and sustainability variables are capable of significantly differentiating the customers of shipping companies in three segments, according to the intensity with which they perceive the service provider's offer, and that they correspond to a high, low, and medium relational and sustainability approach. In this way, the study has demonstrated the heterogeneity of the maritime market at an industrial level.

Significant associations have also been identified through the descriptive variables, business type, company age, duration of relationship with the main shipping service provider. The number of employees has been the descriptive variable with the greatest limitation as a basis for segmentation as it only discriminates significantly between two groups of customers.

This research joins other studies that have indicated the importance of segmentation as a methodological tool to identify customer groups in the B2B context from relational variables (Fuentes-Blasco et al., 2017; Gil-Saura et al., 2015; Moliner-Velázquez et al., 2014) and sustainable practices (Van-den-Berg & De Langen, 2017).

Some differences with respect to other studies are the following: first, relational variables and sustainable practices are used simultaneously as segmentation criteria; second, sustainable practices are analysed from a multidimensional approach (TBL), grouped into socio-economic practices and environmental practices. By comparison, the few studies that have addressed sustainability aspects as demand segmentation criteria have focused solely on environmental sustainability (e.g. Van-den-Berg & De Langen, 2017). Third, this study classifies shippers into importers and exporters, allowing customer attitudes to be further explored. For example, depending on the type of business, the shipping frequency may vary between an exporter and an importer.

5.2. Managerial implications

Considering that customer loyalty is the key to success in this type of relationship and that it is generated based on the activities carried out by the provider (Gil-Saura et al., 2018; Jozef et al., 2019; Ruiz-Martínez et al., 2019), this study shows specific recommendations and actions for each identified segment that can guide managers towards customer retention and a better allocation of their resources.

The segmentation was carried out to identify groups of companies -importers, exporters and re-exporters- and freight forwarders - that allow the marketing efforts of maritime transport providers to be focused as efficiently as possible, seeking to establish lasting commercial relationships. More specifically, its main purpose is to apply differentiated commercial strategies in each target segment, which lead to greater consumer satisfaction and, therefore, to greater profitability of loyalty-based marketing actions (Picón et al., 2004). The identification of segments with similar perceptions regarding sustainable practices and relational variables yet, at the same time, different from the rest of the groups, is situated in the strategic perspective of segmentation, based on the determination of the criteria of segmentation, identification, description, and selection of the different segments in line with the company's strategic purpose.

The usefulness of segmentation is measured in terms of segment classification, homogeneity, and strategic utility, essential for the subsequent implementation and control of marketing strategies in the process result (Wind & Cadorzo, 1974). Classification means that the segments must be made easily identifiable and measurable. Based on the segmentation carried out, we have been able to identify groups of shipping companies with varying levels of intention to continue the relationship. These levels are correlated with the perceptions of the dimensions of sustainability (economic, social, and environmental) and the logistics value.

5.2.1. Segment 1: Companies with 'medium relational and sustainability approach'

The companies grouped in this segment have demonstrated a loyalty bond with the main shipping service provider, since their time trading and time spent in relationship with the shipping company are almost on a par. As these are growing companies, this represents an opportunity for shipping lines to maintain and strengthen this

relationship in the long term. For this, it is recommended that they implement strategies that make it possible to identify the service attributes that most contribute to improving the level of logistics service and therefore satisfaction. Regarding sustainable practices, shipping companies should strive to address the economic and social concerns of this segment, participating in social and volunteer activities in the community. To improve the perception of environmental practices it is suggested that they review the marketing tactics used to disseminate meaningful information about their environmental sustainability initiatives.

5.2.2. Segment 2: Companies with 'high relational and sustainability approach'

Economically-speaking, this group represents a high priority for the shipping company compared to the other segments. The importance of serving this group is due to the fact that it is made up mostly of freight forwarders, which represent large volumes of shipments for the shipping company. Therefore, in order to respond to this group's sustainability requirements, we recommend that shipping companies include freight forwarders in the design of sustainable strategies. The exchange of information and resources between these companies could also contribute towards achieving better economic results. The results obtained from these synergies and the sustainable activities carried out must be communicated through environmental and corporate social responsibility reports to the partners in the chain and especially to the customers of freight forwarders, the ones who exert the greatest pressure to comply with these practices. Freight forwarders are also characterised by having vast knowledge about shipping goods as they work with different types of customers. This knowledge enables them to make service comparisons between shipping companies. Considering that logistics value is the lowest relational variable in this group, it is suggested that the shipping company focus on identifying service attributes that improve the perceived logistics value.

5.2.3. Segment 3: Companies with 'low relational and sustainability approach'

It is recommended for this group to identify which service attributes not used in this study have contributed to the generation of customer loyalty, since they are companies that have a long-standing relationship with the shipping company. Based on the segmentation variables used, it is recommended that shipping service providers identify the causes of low valuations of sustainable practices, especially in regard to the environmental variable. In addition, it is recommended to investigate which aspects of the service should be improved to achieve a greater perception of the value and satisfaction of these companies, especially importers.

It is important to highlight the importance of these perceptions due to their discriminatory power as they are determinants in the segmentation carried out. In this sense, the largest segment ($n = 51$) is identified as the group of companies where transport providers can focus on improvements in their sustainability practices and logistics value to increase their customers' intention to continue the relationship.

5.3. Limitations and future lines of research

Finally, we wish to mention the limitations and possible lines of research.

This study only includes data collected in the Republic of Panama. It could be replicated in other countries where the maritime transport sector is an important part of the country's economic development. In addition, in this research the logistics value has been used one-dimensionally as a basis for segmentation. For future research, this variable could be used from a multidimensional perspective, which would further enrich the study. The services that the shipping company offers vary depending on the type of cargo. It would be interesting to characterise customers based on the type of cargo they handle. Another limitation is that the size of the company has been evaluated based on the number of employees. In this sector, it could be measured based on the number of containers shipped, if it is containerised cargo, and determined if there are differences with the results found.

Note

1. CP/SUAB is Canal de Panamá/Sistema Universal de Arqueo de Buques

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Appendix. Dendogram from hierarchical cluster analysis