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Non-Price Competition in the Port Sector: A Case Study of Ports in Turkey

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ABSTRACT

Although the port sector has been facing increasing competition, there is limited research on how ports compete using non-price competition strategies. There are a few studies on non-price competition in the port sector. However they mainly focus on the marketing aspect. This paper seeks to fill this gap in the literature, especially from a combined marketing-economic perspective. Especially the paper's main objective is to identify the determinants of non-price competition in the port sector and evaluate their effect on various aspects of non-price competition. We start with a general conceptual framework to explain how competition in the sector can be affected by various factors and then propose an analytical framework on non-price competition. The analytical model is then used to support the design of a survey questionnaire. Next, hypothesis tests are conducted using exploratory factor analysis (EFA) and structural equation modeling (SEM) and data collected from a survey of Turkish ports. Based on the analysis results, the implications for port management and future research are also discussed.

1. Introduction

Seaports play a key role in providing services to shipping lines and to cargo owners. Although this is well known, in terms of operation, structure and management functions, ports are not prototype; port services are highly heterogeneous in nature (UNCTAD, 1995). Ports are involved with a large number of market players such as government, port management, shippers, freight forwarding agencies, shipping line companies, trade unions all of which has specific objectives. Trends presently witnessed in the port and shipping sector such as increased operation automation and technological innovations in port operation, capacity expansion, and capital intensive nature of shipping operation have put port operators and authorities under pressure to improve efficiency and productivity. Following this trend many ports have gone

through reforms and partially or fully transferred to private operators (Bichou, 2009, Akar and Esmer, 2015).

Empowering the private sector by allowing them to participate in port operation could lead to more competition in the sector and this has entirely taken a new dimension in port studies. For example, recent studies have focused on inter-port and intra-port competition. The need to promote competition and protect the welfare of port users has also resulted in changes in the regulation of the sector. There is limited research on non-price competition in the sector, despite the fact that ports compete against each other through their prices and charges as well as non-price measures (Chlomoudis et al. 2003). The main objective of this research is to present a general framework on port competition and to identify and evaluate the key factors in non-price competition in the port sector. Especially, it attempts to answer following research questions:

• What is the role of non-price competition in the port sector?
• What are the tools used in non-price competition in the port sector?

The paper is organized as follows. The next section discusses the role of non-price competition in the port sector. Section 3 presents the methodology and section 4 presents the data analysis results. Section 5 discusses the results and implications and Section 6 is the conclusion.

2. Non-price Competition in the Port Sector

According to Udell (1964), the importance of the non-price competition in marketing mix and the variations among industries can be explained by the nature of today's economy. Non-price competition strategies should vary according to the nature of their products/services and the characteristics of the buyers for those products/services. The non-price elements of competition may be stated explicitly and in detail in terms of shipment, conditions of sale, product/service quality, or attempts to differentiate their products/services from those offered by competitors.

Alderson (1937) among the first researchers on non-price competition indicated that the four major factors in non-price competition are improvement in quality and service, differentiation of product, consumer advertising and trade promotion. Over time, a lot of non-price tools have been added. For instance, according to Khatibi and Vergote (2011), R&D, developing long-term relationships with customers and building value are the other vital factors of non-price competition.

One of the most popular non-price instruments is the quality of products/services. Nowadays, the pressure of competition on quality is equally significant with the pressure of competition on price. Non-price forms of competition are important and ports have to give at least equal importance with price competition. Although the effects of price changes are more instant and direct, and price is the easiest communicating tool to potential buyers, competitors can react more easily to price than to non-price tools (Rao, 1984). Table 1 lists the influential factors in port competition and their studies.

Table 1
Factors effecting port competition

Factors	Authors
Level of service quality	Tongzon (2007), Clark *et al.* (2001), NG (2006), Featherstone (1979)
Port charges, Price and Pricing strategies	Tongzon (2007), Bennathan (1979), Haralambides (2002), Yang (1999)
Port's reputation	NG (2006)
Port's accessibility	Huybrechts *et al.* (2002), Tongzon (2007),
Policy regulation	Pi (2004), Tongzon (2007)
Hinterland connections (Networks)	Wan and Zhang (2013), Tongzon (2007), Notteboom and Rodrigue (2005), Slack (1985), Lirn *et al.* (2004), Yuen *et al.* (2012), Heaver (2006), Wong *et al.* (2008), Fan *et al.* (2009), Zeng and Yang (2002)
Co-operation agreements (mergers and alliances)	Heaver *et al.* (2010), Heaver (2002), Parola and Musso (2007), Yap and Notteboom (2007)
Nautical access	Notteboom (2006), Tongzon (2007)
Logistics services in the supply chain	Magala and Sammon (2008)
Maritime connectivity (frequency of shipping services)	Merk and Hesse (2012), Merk and Lee (2013)

As shown in Table 1, most factors affecting port competitiveness are not related to port charges putting aside the connection between pricing and non-pricing strategies. As competition in the sector becomes more intense, ports must be customer-oriented (Brooks and Schellinck, 2015). To stay competitive, ports can rely on the non-price aspects of competition adjusting its strategy to the needs and desires of port users.

Figure 1 shows the key factors influential in non-price competition in the port sector and places the product (port services) at the center of non-price competition; it must be driven by competition. The success of non-price competition depends how the products (services) and their delivery meet port users' needs. It can be said that among the most important factors affecting the demand for port services and service quality expectations are global trade, economic developments and social-related factors. The key variables that affect the level of competition in the sector are the barriers to entry, policy and regulations, and network structure.

Port service quality, technology usage, corporate social responsibility (CSR), promotion, service network coverage and connectivity can be regarded as some of the key tools of non-price competition. As mentioned before, the quality of service is the most important aspects of non-price competition and the use of technology directly affects the quality of service level. The other non-price tool is CSR. According to Heuvel et al. (2014) an accepted conceptualization of CSR is developed by Carroll (1979, 1991a and 1991b) and the author depicted the complexity of a broadly interpreted corporate responsibility by positing four basic components: (a) economic responsibilities (producing goods and services that society wants, being profitable), (b) legal responsibilities (operating under the laws and regulations of society, playing by the rules), (c) ethical responsibilities (conforming to the expectations of society over and above legal requirements, doing what is right, just, and fair), and (d) discretionary responsibilities (contributing to society and improving the quality of life, being a good corporate citizen). These components not only help improve the port's reputation as a good corporate citizen and relationship with the general public and industry stakeholders, they also reveal the port's serious commitment to service quality and care about its customers and stakeholders.
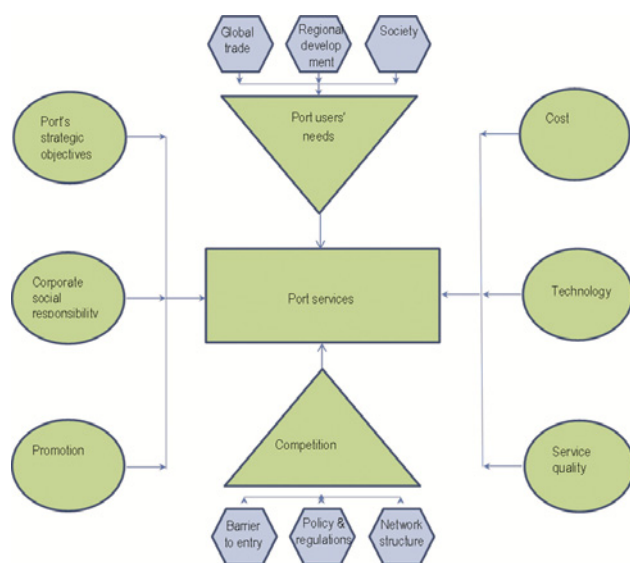
Fig. 1. Conceptual framework

Source: Authors

Promotion, however, can be defined as communication between the port, port users and potential target groups in order to raise port's awareness. The well-known 7Ps in services marketing are: Product (port services), Price (port charges), Promotion (communication), Place (port location), People (human resources), Process (cargo handling facility and technology), and Physical Evidence (what port users see and experience). With the exception of the second P (Price), these can be used as non-price instruments. For example, the third P (Promotion) can include advertising, direct mailing, personnel selling, representatives, organizing port days, international press days and conference, establish domestic networking, school visits, attending international shipping exhibition, domestic fairs and conference (Cahoon, 2007, UNCTAD, 1995).

The above framework also highlights the role of the port network (network structure), of which the port plays a nodal role. Notteboom (2006) stated that shipping lines' decisions to call a port is influenced by many commercial and operational determinants, including the cargo generating effect of the port, the distribution of container origins and destinations over the hinterland, the berth allocation profile of a port, the nautical access, etc. Based on this, the container shipping networks are established as carriers formulate their service schedules to capitalize on opportunities that are presented by evolving container trade patterns along trade routes and relative changes in the competitive profile of the ports of call (Yap and Notteboom, 2011).

3. Methodology

In the light of the literature, it is clear that the use of non-price tools should help improve ports' competitiveness through promoting its quality, general recognition and popularity, communication with port users. In this study, an empirical research using data collected from a survey of Turkish ports is carried out to identify and evaluate the key factors in non-price competition in the port sector. Exploratory factor analysis (EFA) is first applied to identify the underlying strategies in non-price competition in the provision on non-infrastructure port service. Confirmatory factor analysis (CFA) is then conducted to statistically test and evaluate the

relationships between the underlying factors found from EFA. The use of both EFA and CFA is preferred as it provides an effective way to identify and analyse the underlying factors from many variables included in the survey questionnaire. The study uses a Turkish port survey to collect views of port managers on the different aspects of non-price competition and non-infrastructure pricing strategies.

In EFA, the principal component method using the Varimax criterion is applied. Johnson and Wichern (2007 pp. 519-520) explained that the choice of the number of common factors needs to be "based on some combination of (1) the proportion of the sample variance explained, (2) subject-matter knowledge, and (3) the "reasonableness" of the results". Thus the number of the underlying (principal) factors was selected based on the Kaiser criterion. In CFA, the all possible relationships between the underlying factors are first considered and evaluated. Then further analysis is conducted with only variables whose effects are significant.

The survey questionnaire was designed based on the literature and the proposed conceptual framework presented in section II. There four sections in the questionnaire named from A to C respectively. Section A of the questionnaire consists of questions on the participating port's profile. Section B consists of 5-points Likert scale questions on the pricing of non-infrastructure services. Section C consists of 5-points Likert scale questions on non-price competition.

The last section, Section D consists of questions asking about the respondent's profile. Section C is the main section of the survey questionnaire and has totally 26 questions about the factors influential to non-price competition [1]. The contents of the questions included in the questionnaire and the data collected from the survey are presented in section IV of this paper.

The survey questionnaire was first pre-tested with the participation of the peers and obtained comments and feedback upon which revisions were made before being distributed. After completing this process, the survey was sent to respective port authorities as a HTML form and data were gathered anonymously from 2nd of February to 28th of February 2015. Of 49 survey questionnaires sent out the ports which are located in Turkey, handled more than 100,000 TEU or 500,000 tons of bulk and general cargo, and handled 3rt party's cargo. 7 port authorities declined to participate. There were 42 responses to the questionnaires returned as completed responses leaving the response rate of 86%. Thus, despite the limited sample size, the survey has covered the overwhelming majority (86%) of the target population of Turkish ports. Given the exploratory nature of the study, it is important to be cautious about the analysis results. Moreover, due to the focus on one country, the analysis results may not be generalizable to other countries.

4. Results of Analysis

4.1. *Descriptive Statistics of Respondents Profile*

Of the total port surveyed, the majority of the ports are private ports and they are Turkish origin companies. In addition, only 3 Multinational companies are included in the sample. Thus, the sample includes port companies which are rather homogeneous in nature with regard to management and business practices. The summary of ownership and governance model of ports is presented in Table 2 and Table 3. Note that that the majority of respondents are private companies. As such the results of analysis are expected to largely reflect the view of the private

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[1] A copy of the survey questionnaire is available upon request.

companies as opposed to the government owned companies in many parts of the world.

Table 2
Governance model

Ownership	Private port	Privatised Port	Total
Private/Domestic company	<u>30</u>	1	31
Private/Foreign company	1	-	1
Private/Multinational company	3	-	3
Public-Private partnership (PPP)	1	6	7

Table 3
Ownership and administrative structures

Ownership	Private Incorporated company/ domestic capital	Private Incorporated company/ foreign capital	Private Incorporated company/ multinational capital	Private limited company/ domestic capital	Grand Total
Private/ Domestic company	<u>30</u>	-	-	1	31
Private/ Foreign company	-	1	-	-	1
Private/ Multinational company	-	-	3	-	3
PPP	7	-	-	-	7
Grand Total	37	1	3	1	42

More interestingly, the existing competition among Turkish ports is reflected by the pricing strategy that ports follow. The average view of the respondents from each port has indicated that competitor-based pricing (going rate, product line pricing, bundle pricing, cost plus pricing) is widely used (Table 4).

Table 4
Applicability of pricing methods (average score)

Ownership	Penetration pricing[1]	Skimming pricing	Competition pricing[2]	Going-rate pricing[2]	Product Line Pricing[2]	Bundle pricing[2]	Cost Plus pricing[2]	Promotional pricing[2]
Private/ Domestic company	1.6	2.2	3.0	4.2	3.7	3.3	3.1	1.5
Private/ Foreign company	3.0	1.0	4.0	4.0	3.0	3.0	4.0	2.0
Private/ Multinat. company	1.0	1.0	2.0	3.3	3.3	3.0	3.7	1.7
PPP	1.0	2.1	2.9	3.0	3.3	1.7	2.6	1.4
Average	**1.5**	**2.1**	**2.9**	<u>**3.9**</u>	<u>**3.6**</u>	<u>**3.0**</u>	<u>**3.1**</u>	**1.5**

Note: [1]Customer-based
[2]Competitor-based

4.2. *Descriptive Statistics of Main Survey Questions*

Table 5 presents the descriptive statistics of the feedback to the main survey questions.

Table 5
Descriptive statistics

Variable	Mean	Std	95% LL	95% UL
A4 Competition	3.83	1.286	**3.43**	4.23
B1.1. Penetration Pricing	**1.50**	**.969**	**1.20**	**1.80**
B1.2. Skimming Pricing	2.10	1.284	1.70	2.50
B1.3. Competition Pricing	2.93	1.520	2.46	3.40
B1.4. Going-rate pricing	3.90	1.100	**3.56**	4.24
B1.5. Product line Pricing	3.57	1.016	**3.25**	3.89
B1.6. Bundle Pricing	2.98	1.388	2.55	3.41
B1.7. Cost Plus Pricing	3.07	1.552	2.59	3.55
B1.8. Promotional Pricing	1.50	.862	1.23	1.77
C1.1. Feedback-port users	4.31	.869	**4.04**	4.58
C1.2.Departments in tariffs design or revision process	4.05	1.058	**3.72**	4.38
C1.3. Advertising methods	4.24	1.055	**3.91**	4.57
C1.4. Promotional campaigns	3.24	1.358	2.82	3.66
C1.5. Bundling of non-infrastructure services	3.26	1.380	2.83	3.69
C1.6. Offer reliable information on cargo	4.93	.261	**4.85**	5.01
C1.7. Offers negotiable non-infrastructure services tariffs under certain conditions	3.45	1.214	3.07	3.83
C1.8 Offers negotiable non-infrastructure services tariffs under certain conditions	3.86	1.026	3.54	4.18
C1.9. Offers port users a lump sum price payable in advance	1.90	1.031	1.58	2.22
C2.1. Offer differentiated non-infrastructure tariffs	4.12	1.234	**3.74**	4.50
C2.2. Diversified non-infrastructure services	4.36	.958	**4.06**	4.66
C2.3. Offers packages of non-infrastructure service	3.33	1.262	2.94	3.72
C2.4. Offer customise non-infrastructure services to any customer	4.12	.916	**3.83**	4.41
C2.5. Offers regular port users discounted prices for all non-infrastructure services	3.60	1.170	3.24	3.96
C2.6. Offer cargo owners reliable information on cargo at port all the time	4.90	.370	**4.78**	5.02
C3.1. 24 hour surveillance over cargo in the port	4.95	.216	**4.88**	5.02
C3.2. 24 hour surveillance over vessels berths in the port	4.95	.216	**4.88**	5.02
C3.3. 24 hour surveillance over vessels in the anchorage area	3.43	1.309	3.02	3.84
C3.4. Mechanism to track on the vessel turnaround times	4.83	.537	**4.66**	5.00
C3.5. Continue to invest for improving hinterland connectivity	3.90	1.206	3.52	4.28
C3.6. Continue to invest for improving multimodal transport operation to and from the port	4.07	1.045	3.74	4.40
C4.1. Port land management plan	4.55	.889	**4.27**	4.83
C4.2. Invested on reducing sound and water pollution of the port	4.74	.497	**4.59**	4.89
C4.3. Established green zones at the port adjacent precinct	3.57	1.151	3.21	3.93
C4.4. Involved in community engagement works	4.21	.951	**3.91**	4.51
C4.5. Supporting environment improvement programs	4.52	.833	**4.26**	4.78

The competition level faced by individual ports (survey question A4) has the mean value of 3.83 and the lower and upper 95% confidence levels of 3.43 and 4.23 respectively. Given the scale from 1 (low competition) to 5 (high competition), this suggests the sector is moderately but not highly competitive. This is in line with the current

trend in the sector as suggested by the literature, which also notes that the level of competition between ports varies across countries and regions in the world (see, for example, Lam and Yap, 2006, Nguyen, Chin, Tonzon and Bandara, 2015).

Regarding the applicability of pricing methods, only "Going-Rate" (competitor-based) pricing and Product Line pricing are the most preferred pricing methods with the 95% confidence lower limits of 3.56 and 3.25 respectively. The pricing methods with the average scores of applicability (awareness) below the midpoint are Penetration (Customer-based), Skimming (Customer-based), Competition (Competitor-based), Promotional (Competitor-based), Bundle (Competitor-based) and Cost Plus (Competitor-based) methods.

The rest of the main survey questions concern non-price competition measures. All non-pricing measures except C1.9 ("My port offers port users a lump sum price payable in advance for the use of non-infrastructure services") have the mean score above 3. This strongly indicates that non-price competition is important to ports.

Regarding the importance of communication, two strongly preferred elements of communication are obtaining feedback from port users (C1.1) and providing them with reliable information about their shipment (C1.6). In addition internal communication and information sharing among different port departments with regard to tariff design and revision does exist (C1.2).

With regard to service differentiation of non-infrastructure tariff setting of your port, offering cargo owners reliable information on cargo at port all the time is the most important practice (C2.6) with higher (4.48) confidence level. In addition offering differentiated non-infrastructure tariffs (C2.1) along with more diversified non-infrastructure services (C2.2) and offering customise non-infrastructure services to any customer (C2.4) are the most prevalence practices with the 95% confidence lower limits of 3.74 , 4.06 and 3.83 respectively.

Next factors affecting service quality of non-infrastructure services includes 24 hour surveillance over cargo (C3.1), over vessels berths (C3.2) and established mechanism to track on the vessel turnaround times (C3.4) with a 95% lower confidence limit of 4.88, 4.88 and 4.66 respectively. In addition, improving multimodal transport operation to and from the port is also an influential factor (C3.6).

Lastly, the surveyed ports indicated their strong commitment to corporate social responsibility [2] , including reducing air and water pollution (C4.2), port land management plans (C4.1), supporting environment improvement programs (C4.5), and involved in community engagement works (C4.5) all of which have a lower confidence limit greater than 3.91.

4.3. *Explanatory Factor Analysis*

In order to derive relevant factors for the surveyed data, exploratory factor analysis was conducted using Principal Component Analysis (PCA) as the extraction method. Johnson and Wichern (2007 pp. 519-520) explained that the choice of the number of common factor needs to be "based on some combination of (1) the proportion of the sample variance explained, (2) subject-matter knowledge, and (3) the "reasonableness" of the results". Thus the number of the principal factors was selected based on the Kaiser criterion; the number of factors is determined to ensure the eigenvalue of the correlation matrix is at least 1. In this study, the Varimax rotation method is applied.

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[2] See Lu, Shang and Lin (2012), for example, for more detail about corporate social responsibility and sustainable development of ports.

Table 6
Total variance explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	**3.188**	24.524	**24.524**	3.188	24.524	24.524	2.909	22.377	22.377
2	**2.529**	19.453	**43.977**	2.529	19.453	43.977	2.151	16.549	38.926
3	**2.034**	15.646	**59.624**	2.034	15.646	59.624	2.087	16.055	54.980
4	**1.457**	11.205	**70.828**	1.457	11.205	70.828	1.751	13.468	68.448
5	**1.257**	9.667	**80.496**	1.257	9.667	80.496	1.566	12.047	80.496
6	.637	4.900	85.396						
7	.600	4.617	90.013						
8	.443	3.406	93.419						
9	.347	2.671	96.090						
10	.219	1.687	97.777						
11	.130	.999	98.776						
12	.092	.711	99.487						
13	.067	.513	100.000						

Table 6 presents the total variance explained by the all factors associated with the feedback obtained from 34 survey questions concerning the factors importance to non-infrastructure tariffs. The first five factors representing factors influential to non- infrastructure tariffs have the eigenvalues of 3.188, 2.529, 2.034, 1.457 and 1.257 respectively, which explain 80% of the total variance. Thus, only five factors can be retained for further analysis, according to the Kaiser criterion.

The EFA has identified the following five key areas in non-price competition strategies:
- Customer care
- Service customisation and bundling
- Service expansion
- Service diversification
- Auxiliary service

Each strategy under each factor has very high loadings suggesting these are distinctive elements of port service non-price competition. Moreover, they suggest different ways of product differentiation. For example continuous access to cargo tracking information (question C1_6) and surveillance (question C3_2) show the port's care about their customers as a way to differentiate their services from those offered by competitors. Other activities such as commitment to improving operational efficiency (question C3_6) and investment in reducing air and water pollution (question C4_2) are examples of service differentiation measures used by ports.

Table 7
Rotated component matrix

	Component				
	Customer care	Service customisation and bundling	Service expansion	Service diversification	Auxiliary service
C1_6	**.894**	-.163	.065	-.029	-.003
C2_6	**.901**	.021	-.039	.082	-.110
C3_2	**.947**	.012	.114	.088	-.109
C1_5	-.126	**.755**	.151	.094	.051

C1_7	-.013	**.843**	.157	.038	-.054
C1_8	.033	**.884**	-.195	-.173	.025
C1_2	.285	.163	**.798**	-.041	-.092
C3_6	.092	-.013	**.762**	.309	.008
C4_2	-.211	.023	**.832**	.004	.228
C1_3	-.146	.003	.249	**.841**	.076
C2_2	.387	-.027	-.050	**.875**	-.097
C3_3	.026	-.098	.042	-.207	**.916**
C4_3	-.283	.154	.084	.290	**.788**

4.4. *Confirmatory Factor Analysis*

Next, CFA is conducted to confirm the validity of the factors extracted from EFA (Figure 2). The following path diagram is developed based on EFA as a start of CFA. Several structures derived from this have been tried but none has resulted in superior results.
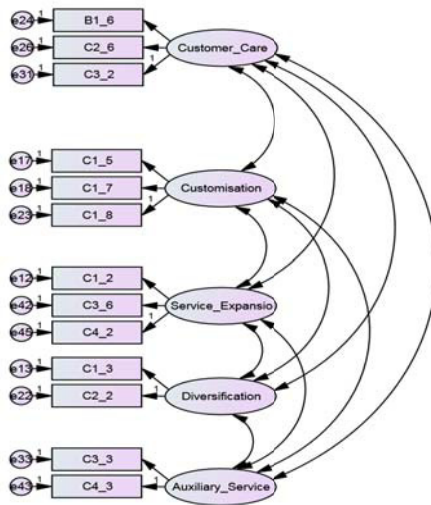

Fig. 2. Confirmatory Factor Analysis

The 'causal' variables (Table 8) are all significant and indicating that factors extracted from EFA fit the latent construct. Further, as shown in table, the covariance between most non-pricing strategies (customer care, customisation, etc.) are not significant except customer care and diversification. This indicates the 'independence' between different non-pricing strategies.

Table 8
The causal variables

			Estimate	S.E.	C.R.	P	Label
C3_2	<---	Customer_Care	1.000				
C2_6	<---	Customer_Care	1.625	.190	8.553	***	
B1_6	<---	Customer_Care	-2.047	1.025	-1.997	.046	
C1_5	<---	Customisation	1.049	.320	3.280	.001	
C1_7	<---	Customisation	1.137	.308	3.692	***	
C1_8	<---	Customisation	1.000				
C1_2	<---	Service_Expansion	1.609	.506	3.179	.001	
C3_6	<---	Service_Expansion	1.580	.504	3.137	.002	
C4_2	<---	Service_Expansion	1.000				
C4_3	<---	Auxiliary_Service	1.000				
C3_3	<---	Auxiliary_Service	.008	.321	.025	.980	
C2_2	<---	Diversification	1.000				
C1_3	<---	Diversification	.023	.272	.086	.932	

			Estimate	S.E	C.R.	P	Label
Customisation	<-->	Auxiliary_Service	.142	.154	.922	.356	
Customisation	<-->	Diversification	-.067	.119	-.559	.576	
Auxiliary_Service	<-->	Diversification	.175	.148	1.183	.237	
Service_Expansion	<-->	Diversification	-.083	.067	-1.240	.215	
Customer_Care	<-->	Customisation	-.005	.032	-.160	.873	
Customisation	<-->	Service_Expansion	.015	.069	.223	.823	
Customer_Care	<-->	Service_Expansion	.003	.018	.151	.880	
Customer_Care	<-->	Diversification	.113	.040	2.846	.004	
Customer_Care	<-->	Auxiliary_Service	-.056	.041	-1.392	.164	
Service_Expansion	<-->	Auxiliary_Service	.097	.085	1.143	.253	

	Estimate	S.E	C.R.	P	Label
Customer_Care	.046	.012	3.721	***	
Customisation	.619	.243	2.550	.011	
Service_Expansion	.173	.069	2.502	.012	
Auxiliary_Service	123.178	4837.373	.025	.980	
Diversification	28.734	330.918	.087	.931	
e31	.005	.003	1.417	.156	
e26	.028	.011	2.604	.009	
e24	1.610	.383	4.210	***	
e17	1.138	.313	3.636	***	
e18	.530	.220	2.407	.016	
e23	.266	.153	1.741	.082	
e12	.686	.199	3.442	***	
e42	.702	.201	3.495	***	
e45	.078	.044	1.752	.080	
e43	-121.568	4837.543	-.025	.980	
e33	1.752	.523	3.354	***	
e22	-27.712	331.046	-.084	.933	
e13	1.166	.328	3.554	***	

The value of CMIN/df is 1.713 which indicates a very good fit of the model. CFA, which is similar to relative non-centrality index (RNI), has a value close to 1 also indicating a very good fit. The good fit is also confirmed by the value of PCLOSE of less than 5%. The model fit summaries are presented in Table 9.

Table 9
Model fit summary

CMIN					
Model	NPAR	CMIN	DF	P	**CMIN/DF**
Default model	36	94.222	55	.001	**1.713**
Saturated model	91	.000	0		
Independence model	13	269.894	78	.000	3.460

RMSEA				
Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.141	.090	.188	**.004**
Independence model	.261	.228	.296	.000

5. Discussion and Implications

This study's main objective is to identify the key factors in non-price competition in the port sector and evaluate their effect on various aspects of non-price competition. Firstly, a conceptual framework on general port competition was established to explain the factors affecting the competition. An analytical framework showing the external and internal variables (factors) influential to non-price competition was proposed. A survey questionnaire was then developed to assist data collection from Turkish sea-ports. Exploratory factor analysis and confirmatory factor analysis was applied to test hypotheses and identify strategies in non-price competition on non-infrastructure port services.

The results of exploratory factor analysis indicate five non-price competition strategies used by Turkish ports, namely customer care, service customisation and bundling, service expansion, service diversification and auxiliary service. The results of confirmatory factor analysis indicate some association between the customer care and diversification variables and independence between the remaining variables. A number of implications can be drawn from the findings as discussed below.

As Notteboom and Winkelmans (2001, p.83) pointed out, "seaports that will succeed in the 21st century will be those that are `customer led' who really understand customer needs and who can offer `best-in-class' performance". From the shippers' perspective, port selection is decided based on not only port charges but also other factors such as customer services, claims handling, equipment available, flexible schedules and financial stability (Bagchi, 1989). These directly affect the level of customer satisfaction and therefore are important to competition strategies (Nir et al, 2003). Ports can improve public image and reputation through their commitment to corporate social responsibility (CSR) measures such as reducing air and water pollution, green zones, community engagement and sustainable development of the region.

Customer service and care covered by the current study are critical to the customer satisfaction level. Especially, port users are more concerned with indirect costs associated with delays, loss of market share, loss of customer confidence and opportunities foregone due to inefficient service, than with port charges (Tongzon, 1995). Thus, as indicated by the analysis results, ports should pay more attention to customer care, such as providing continuous access to cargo-tracking information and surveillance over vessels in the port.

Factors critical to terminal competitiveness in the supply chain era include cost advantage, service quality, reliability, customization and responsiveness to customers' needs and are increasingly regarded as critical in the measurement of contemporary container terminal performance (Song and Panayides, 2008). In that respect, service customisation, service bundling and negotiable tariffs would help improve the terminal's competitiveness.

The next important factor in non-price competition is service diversification including advertisement, communication and offering a diverse range of services. Port operations can be multi-dimensional depending on the strategic objectives the port wants to achieve. Thus, modern ports can diversify their services beyond traditional logistics activities into value added logistics services (Tongzon and Heng, 2005). Cullinane and Song (2002) claimed that removing the public status of ports could allow them to diversify their activities and increase the level of competition in the port industry. This is particularly true in the case of Turkish port sector that is mainly privately owned and operated.

The last factor influential to non-price competition is auxiliary services

such as providing 24 hour vessel surveillance in the anchorage area and establishing green zones at the port's precinct. Maritime surveillance is critical for the safety and security of ships, their crew members, cargo and the public (Baholli at al. 2013). Measures such as putting up security fence, intelligence unit, security warnings, etc. would help reduce terminal vulnerability, operational disruptions and improve service quality (Harrald, at al., 2004). According to Chlomoudis et al. (2003, p.90), "a system of many independent firms that are competing and co-operating requires an institutional framework that prevents potentially destructive price competition and favours competition based on innovation and other non-price parameters". Thus, as an implication, non-price competition is necessary in curtailing price competition and in favour of service quality and port users' satisfaction.

6. Conclusion and Future Research

This paper is an exploratory research to the gap in the literature on non-price competition in the port sector, especially from the marketing-economic perspective. The paper identifies the determinants of non-price competition in the port sector and evaluate their effect on various aspects of non-price competition. A general conceptual framework on port competition is proposed to explain how competition in the sector can be affected by various factors and to inform further analysis of non-price competition using survey data on a number of factors external and internal to ports. Both exploratory factor analysis and confirmatory factor analysis are used, and the results of data analysis indicate that customer care, service customisation and bundling, service expansion, service diversification and auxiliary services are the influential factors in non-price competition in the sector.

The study is subject to some few limitations. As there are totally only 49 ports in Turkey, the sample used by the study covering 86 % of the population is rather small and may adversely affect the reliability of the analysis results as well as the number of variables/questions included in the analysis. Thus, future research can be benefit from larger sample size with more questions/variables and covering more than one country and ports with different governance models. Future research can also include the level of supply chain integration and network connectivity as additional measures in non-price competition.

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