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Doctor of Philosophy (Ph.D.)

**SEGMENTATION APPROACHES IN BUSINESS-TO-
BUSINESS MARKETING: AN APPLICATION ON
CONTAINER SHIPPING SERVICES**

Gökçay BALCI

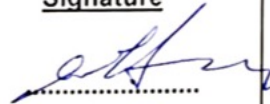
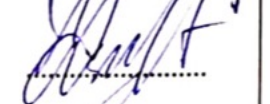
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DECLARATION

I hereby declare that this doctoral thesis titled as “**Segmentation Approaches in Business-to-Business Marketing: An Application on Container Shipping Services**” has been written by myself in accordance with the academic rules and ethical conduct. I also declare that all materials benefited in this thesis consist of the mentioned resources in the reference list. I verify all these with my honour.

23/01/2019

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ABSTRACT
Doctoral Thesis
Doctor of Philosophy (Ph.D.)
Segmentation Approaches in Business-to-Business Marketing: An Application
on Container Shipping Services
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Dokuz Eylül University
Graduate School of Social Sciences
Department of Maritime Business Administration
Maritime Business Administration Program

Container shipping significantly contributes to the international trade and supply chain systems, and plays a key role in the competitive advantage of exporters and importers. However, container shipping market has been facing several challenges and structural changes. The competition is fiercer and the profitability levels of container lines have been very low. The marketing strategies have become more important compared to past in the market. Understanding the customer needs and wants, and manage their requirements effectively have become very critical.

The purpose of this dissertation is to investigate market segmentation in container shipping, explore the benefit segments, and discuss the benefit segments considering practical applications. The empirical part of this dissertation consists of two main researches. The first one is a qualitative study which conducts semi-structured interviews with container lines located in Izmir. The qualitative study has explored the practical segmentation application of container lines including the segmentation bases they use and the purposes they target. Based on the findings of the interviews, a theoretical a-priori segmentation model has been proposed.

The quantitative research aims to find out the benefit segments in container shipping market adopting a post-hoc approach. A survey is conducted with exporters located in Aegean Region of Turkey and a total of 356 responses

have been collected. In the research, first container line selection criteria measure is developed through exploratory and confirmatory factor analyses. A total of five selection factors are ascertained. Then, cluster analysis is conducted by using factor scores as clustering variables. The cluster analysis has revealed a total of six benefit (post-hoc) segments in the market: Time-sensitive Cost Seekers, Pragmatic Service Buyers, Non-urgent Cost Seekers, Value-added Service Buyers, Relationship Seekers, and Time Seekers.

The six segments are distinctive in terms of the selection criteria of shippers. The segments meet the criteria of effective market segmentation: Substantial, differentiable, actionable, measurable, and accessible. The segments also provide evidence for the criterion validity. Substantial number of statistically significant associations between the segments and descriptors are achieved. A detailed discussion of the results of this research is presented at the end of related section.

Upon the qualitative and quantitative analysis, the segmentation bases of container lines explored in the qualitative research are tested to understand if selection criteria between the a-priori segments differ. In this way, we can see if the segmentation bases of container lines in practice in Izmir create segments that are differentiable. The results indicate that the a-priori segments are not as differentiable as the post-hoc segments in our quantitative research in terms of the selection criteria, or in other terms, benefits sought by container shippers. This dissertation claims that benefit segmentation using a post-hoc approach is more effective than a-priori approach used by companies in container shipping market.

Keywords: B2B marketing, benefit segments, cluster analysis, container shipping, exporters, market segmentation, services marketing.

ÖZET

Doktora Tezi

İşletmeden İşletmeye Pazarlamada Bölümlendirme Yaklaşımları: Konteyner

Taşımacılığı Hizmetleri Üzerine Bir Uygulama

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Konteyner taşımacılığı uluslararası ticarete ve tedarik zincirlerine önemli katkı yapmakta ve ihracatçılar ile ithalatçıların rekabetçi avantajında ciddi bir rol oynamaktadır. Ancak konteyner taşımacılığı pazarı çeşitli zorluklarla ve yapısal değişikliklerle karşı karşıyadırlar. Rekabet daha çetin olup konteyner hatlarının karlılıkları düşük seviyelerde seyretmektedir. Konteyner taşımacılığında pazarlama stratejileri öncesine göre daha önemli hale gelmiştir. Müşteri ihtiyaç ve isteklerini anlamak ve bunları etkili bir şekilde yönetmek çok önemlidir.

Bu tez çalışmasının amacı konteyner taşımacılığında pazar bölümlemesini incelemek, fayda segmentlerini keşfetmek ve pratik uygulamaları dikkate alarak fayda segmentlerini tartışmaktır. Bu tezin ampirik kısmı iki ana araştırmadan oluşmaktadır. Bunlardan ilki, İzmir'de bulunan konteyner hatları ile yarı yapılandırılmış görüşmeler yapan nitel bir çalışmadır. Nitel çalışma, kullandıkları pazar bölümleme değişkenleri ve hedefledikleri amaçlar dahil olmak üzere konteyner hatlarının pazar bölümleme uygulamalarını ortaya koymuştur. Mülakatların bulgularına dayanarak teorik bir öncül (a-priori) pazar bölümleme modeli önerilmiştir.

Nitel araştırma, sonsal (post-hoc) yaklaşımı benimseyerek konteyner taşımacılığındaki fayda segmentlerini keşfetmeyi amaçlamaktadır. Ege Bölgesi'ndeki ihracatçılarla bir anket gerçekleştirilmiş ve toplam 356 cevap toplanmıştır. Araştırmada, öncelikle keşifsel ve doğrulayıcı faktör analizleriyle

konteyner hattı seçim kriterleri ölçeği geliştirilmiştir. Toplam beş seçim faktörü belirlenmiştir. Daha sonra, faktör skorları kümeleme değişkenleri olarak kullanılarak kümeleme analizi gerçekleştirilmiştir. Kümeleme analizi, toplam altı fayda segmenti ortaya çıkarmıştır: Zamana Duyarlı Maliyet Arayanlar, Pragmatik Hizmet Alıcılar, Acil-olmayan Maliyet Arayanlar, Katma Değerli Hizmet Alıcılar, İlişki Odaklılar ve Zaman Odaklılar.

Araştırmada keşfedilen altı segment, konteyner hattı seçim kriterleri açısından anlamlı farklılıklar göstermektedirler. Segmentler, büyüklük, farklılaşabilme, eyleme geçirilebilme, ölçülebilme, ve erişebilme gibi etkin pazar bölümlendirme kriterlerini karşılamaktadır. Segmentlerin ayrıca ölçüt geçerliliği de kanıtlanmıştır. Segmentler ve tanımlayıcı değişkenler arasında istatistiksel önemli sayıda anlamlı ilişki elde edilmiştir. Bu araştırmanın sonuçlarına ilişkin ayrıntılı bir tartışma, ilgili bölümün sonunda sunulmuştur.

Kalitatif ve kantitatif analizler üzerine, nitel araştırmada bulunan konteyner hatlarının pazar bölümlendirme temelleri, segmentler arasındaki seçim kriterlerinin farklı olup olmadığını anlamak için test edilmiştir. Böylelikle, İzmir'deki uygulamada konteyner hatlarının segmentasyon tabanlarının farklılaşabilir bölümler oluşturup oluşturmadığını görülmektedir. Sonuçlar, öncül segmentlerin seçim kriterleri açısından, başka deyişle konteyner yükleyicilerinin beklediği faydalar açısından, sonsal segmentler kadar ayrıştırıcı olmadığı tespit edilmiştir. Bu tez, sonsal yaklaşımı kullanan pazar bölümlendirmenin, konteyner taşımacılığı pazarındaki şirketler tarafından kullanılan önsel yaklaşımdan daha etkili olduğunu açıklamaktadır.

Anahtar Kelimeler: İşletmeden işletmeye pazarlama, fayda segmentleri, kümeleme analizi, konteyner taşımacılığı, ihracatçılar, pazar bölümlendirme, hizmet pazarlaması.

**SEGMENTATION APPROACHES IN BUSINESS-TO-BUSINESS
MARKETING: AN APPLICATION ON CONTAINER SHIPPING SERVICES**

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ABBREVIATIONS

3PL	Third party logistics
AID	Automatic interaction detection
ANN	Artificial neural networks
ANOVA	Analysis of variance
AVE	Average variance extracted
B2B	Business to business
CHAID	Chi-square automatic interaction detection
CFA	Confirmatory factor analysis
CFR	Cost and freight
CIF	Cost, insurance, and freight
CPV	Customer perceived value
CR	Composite reliability
D2D	Door-to-door
DAP	Delivered at place
DDP	Delivery, duty paid
DMU	Decision making unit
EDI	Electronic data interchange
EFA	Exploratory factor analysis
EXW	Ex-works
FAS	Free alongside
FOB	Free on board
IAME	International Association of Maritime Economists
ICB	Industrial classification benchmark
LCL	Less than container load
LSQ	Logistics service quality
MSV	Maximum shared variance
NA	Not applicable
NCS	Non-urgent cost seekers
PSB	Pragmatic service buyers
RMSEA	Root mean square error of approximation
RS	Relationship seekers

SEM	Structural equation modelling
SRMR	Standardized root mean residual
TCS	Time-sensitive cost seekers
TEU	Twenty-foot Equivalent Unit
TLI	Tucker Lewis Index
TS	Time seekers
UNCTAD	United Nations Conference on Trade and Development
US	United States
USD	United States Dollar
VAS	Value added services
VASB	Value-added service buyers
VSA	Vessel sharing agreement

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INTRODUCTION

Background

The invention of containers by McLean in 1956 has changed the world by contributing a lot to the world trade and globalization (Levinson, 2016). Containerization – the process of commodities of other shipment forms such as bulk and loose cargoes being transported in containers – has significantly increased in the last six decades. As a result, the share of containerized cargo in total seaborne trade has dramatically increased (UNCTAD, 2017). This increase is very reasonable because containerization has provided safer, faster, and more reliable transportation compared to past.

Container shipping is believed to have a major effect on international trade and globalization. Bemhofen et al. (2016), for instance, investigate the effects of containerization on economic development and globalization through panel data between 1962 and 1990. They find that containerization is the “*driver of 20th century economic globalization*” (Bemhofen et al., 2016). Thanks to its benefits, container shipping has enabled multinational companies to locate their production facilities at low-cost countries. The geographic separation of production and consumption has increased the international trade, and thereby has boosted the demand on container shipping.

Similar to public transportation services, container lines have regular services between scheduled ports whether the vessel capacity is full or not (Haralambides, 2007). Because of this regularity, the market has a high fixed cost and, therefore, strategic cooperation has been common in liner shipping. The market structure of container shipping has significantly changed during the last decades. The conference system – in which some container lines cooperate with each other and fix the freight rates for specific routes – is not allowed in the main trade routes anymore (Benacchio et al., 2007). The container lines are not allowed to fix the price, apply common tariffs, and adjust capacity following the Ocean Shipping Reform Act 1998 in the US and Repealing of Block Exemption on Liner Shipping (4056/86) in 2008 in European Union.

The high fixed-cost structure and the repeal of liner conference systems from the main routes cause serious problems for the container lines. Since they cannot fix the price and adjust capacity, the competition in the market is tougher compared to before. The customers, shippers and forwarders, have become more powerful. Besides, the shrinkage of demand after the crisis of 2008 has made the market facing even tougher conditions. Thus, the competition between the container lines is keen. In recent years, the profitability rates of container lines are quite low that many of them actually have reported net losses (Glave et al., 2014). One of the large global container carriers, Hanjin, has bankrupted recently. To minimize costs, container lines started to utilize very large vessels which can carry over 21.000TEUs. The usage of larger vessels not only leads to overcapacity problems but also causes the services offered by container lines to be less flexible and reliable (Murnane et al., 2016).

Another cost minimization method for container lines is to build strategic alliances with other lines. In many cases, the carriers serve their customers by sharing the same vessels without price fixing and capacity adjustments. They need to compete with their strategic partners to attract new customers and keep the existing ones. However, differentiation – which is already difficult in the market – has become more difficult for the container lines because of the increasing vessel shares. Thus, the container shipping is getting a more commodity-like market (Balci et al., 2018).

Overall, considering the current situation in container shipping market, several issues challenge the container lines. The industry growth is not as high as it used to be. Container lines cannot only rely on the industry growth to survive in the market. Competition has become fiercer while the market has become more commoditized as well. Overcapacity and low profitability are major concern of all lines. The container lines have focused on cost reduction in several ways but it does not help them to keep a healthy growth. To overcome the capacity utilization problem, besides schedule and route planning, container lines need to build long-term relations with customers and manage them effectively (Balci and Cetin, 2017).

In such a difficult market situation which has become commodity-like, it is very crucial for container lines to differentiate themselves. In commodity-like

markets and industrial services, differentiation can be mostly achieved by customer service (Gebauer et al., 2011; Kyj and Kyj, 1989; Raddats and Easingwood, 2010), personal interaction and relations (Ulaga and Eggert, 2006; Vandenbosch and Dawar 2002), responsiveness (Lapierre, 2000), and unique customer experiences (Marquardt et al., 2011). In container shipping, especially in the era of strategic alliances, elements of customer service and relations are the key differentiators (Balci et al., 2018). All these issues require container lines to be more customer-focused and to understand the needs and wants of customers. In this way, more customized solutions can be offered to the customers.

However, until recently, majority of the container shipping research was focused on cost reduction, optimization, network and route design etc. Some studies actually concern the needs and wants of customers (Brooks, 1983; 1990 and 1995; Collison, 1984; Kannan et al., 2011; Lu, 2003; Tuna and Silan, 2002). However, these studies do not investigate the selection criteria of customer within the marketing perspective in detail. In fact, marketing in container shipping has been ignored until recently when the lines need to be more customer-focused. A call-for-paper named “Shipping and Port Marketing: Policy and Strategy” is issued by the reputable Transport Policy journal. A quotation from that call for paper explains how marketing has actually been overlooked: *“Despite the growing relevance of marketing policies and strategies in shipping and port industries, however, no extensive academic research has been yet made”* (IAME, 2017).

The imperfect competition theory suggests that both demand and supply in the market are heterogeneous. It implies that the expectations of customers, or the benefits they seek for, are actually different in the market. For effective marketing policies, these heterogeneous expectations of customers should be detected and differentiated marketing programs should be designed for the customers.

Understanding the needs and wants of shippers is vital. However, several issues also arise for understanding the needs and wants of customers. Thousands of shippers exist and they are from different industries, with different product characteristics in terms of value and sensitivity, shipping their cargoes to different destinations, and located in different regions. The size of customers also varies significantly: some of them have a monthly container volume as low as 1 while some

has as high as over a few thousands. Besides, the process of container shipping including exporting and importing is a very complex task. Expectations of customers also change significantly depending on many issues. Understanding the needs and wants of these great number and diversified shippers may be too costly and difficult if the planning and assessment of marketing program is not performed properly (Balci and Cetin, 2017).

Customer segmentation can be an ideal solution to understand specific needs and wants of different customer groups and apply differentiated marketing programs. Although market segmentation has several advantages such as allocation of resources more efficiently, implementing differentiated marketing, targeting some groups, and arranging promotional strategies (Dibb, 1998; Kotler and Armstrong, 2010; and Weinstein, 2013), market segmentation has been studied by only a few authors in the container shipping context (Collison, 1984; Wen and Lin 2015).

Research problem and purpose of the study

Market segmentation is needed in the container shipping especially reckoning the current difficulties. However, market segmentation is not an easy process particularly in industrial context such as container shipping services. Although segmentation has been studied by several authors since its conceptualization by Smith (1956), the research on segmentation still matters because there are still some problems and lack of agreement specifically in B2B markets (Dibb and Wensley, 2002). Besides, segmentation in B2B is a dynamic process that should be periodically reviewed (Mitchell and Wilson, 1998).

B2B segmentation is believed to be more complicated than consumer markets. Several authors mention the complex issues peculiar to B2B segmentation (Dickson, 1994; Dibb and Wensley, 2002; Thomas, 2016). One of the most common issues mentioned in the literature is the gap between theory and practice in B2B segmentation (Boejgaard and Ellegaard, 2010; Kalafatis and Cheston, 1997). Numerous reasons are listed in the literature on this issue, but the main result is the fact that companies in practice usually utilize simple segments by adopting a-priori

approach and using macro bases such as company size, location, and industry type (Abratt, 1993).

Although a-priori approach is more preferred in practice, the literature frequently stresses the superiority of post-hoc approach in which micro bases are utilized e.g. selection criteria or purchase behavior (Wedel and Kamakura, 2000). In this approach, segments are not readily available but explored after some analyses. The post-hoc approach can also be named as “benefit segmentation” – conceptualized by Haley (1968) for the first time – because the segmentation bases are usually the benefits customers seek.

In container shipping, no study has so far revealed the benefit-segments of shippers. One study segmented the shippers based on a-priori approach (Collison, 1984) and the other study segmented freight forwarders (Wen and Lin, 2015). One recent study in Taiwan segmented the shippers of container shipping (Chen et al., 2017). Yet, the main aim of that study is to determine service attributes affecting customer retention rather than investigating the benefit segments. Thus, a main question remains to be answered in container shipping: What are the benefit segments in the market? This main question should be supported by answering other questions: What are the characteristics these benefit segments? Can they be significantly described by firmographics? Are these segments practically valid?

One of the reasons of the gap between theory and practice in B2B segmentation is that academic studies often neglect the practical applications and requirements of the companies (Clarke, 2009). No scientific academic paper or a PhD thesis has so far revealed the market segmentation applications of container lines in practice. Therefore, the practical applications of container lines should be studied. In this way, the study can help to discover the answers of following questions: Do container lines segment their market? Which approaches and methods do they use to segment the market? What are the objectives of their segmentation?

In the light of the background and research questions generated here, the purpose of this study is to thoroughly investigate market segmentation in container shipping, explore the benefit segments, and discuss the benefit segments considering practical applications. To accomplish the main aim of the study, following objectives are generated:

- To investigate segmentation applications of container lines to explore the approach they adopt, the bases they use, and the objectives they aim when segmenting the market.
- If the findings are in parallel with other B2B studies which state that firms only use macro bases, then to develop a theoretical framework of market segmentation using macro bases to reveal distinct needs of shippers.
- To discover benefit segments of container shipping market via a quantitative and appropriate analysis method.
- To identify the macro bases that can describe benefit segments in container shipping
- To discuss benefit segments (post-hoc) found in the quantitative study and segments found in the qualitative study.

Research Process

The research consists of total four chapters. The first chapter is designed as an introduction to B2B market segmentation that explains the theoretical background of segmentation, evaluation of market segmentation in the development of marketing discipline, and the issues of B2B market segmentation in the literature. The second chapter investigates the container shipping market within marketing perspective. It explains the characteristics – competition level, actors, and strategic alliances etc. – of container shipping market; assesses the customer value in container shipping; and evaluates selection criteria and service quality in container shipping.

The third chapter aims to explain analysis methodologies and approaches in market segmentation. It first demonstrates the bases, approaches, and methods used in market segmentation in general by providing a classification. Then it includes three systematic literature reviews consisting of only empirical studies in B2B segmentation, freight transport segmentation, and passenger transport segmentation. Each of the reviews includes what approaches are adopted, what bases are used, and what objectives are aimed etc. The reviews also include the details of methodology such as the analyses, sample, and number of segmenting variables etc. The chapter

ends with a discussion of market segmentation and methodology in container shipping.

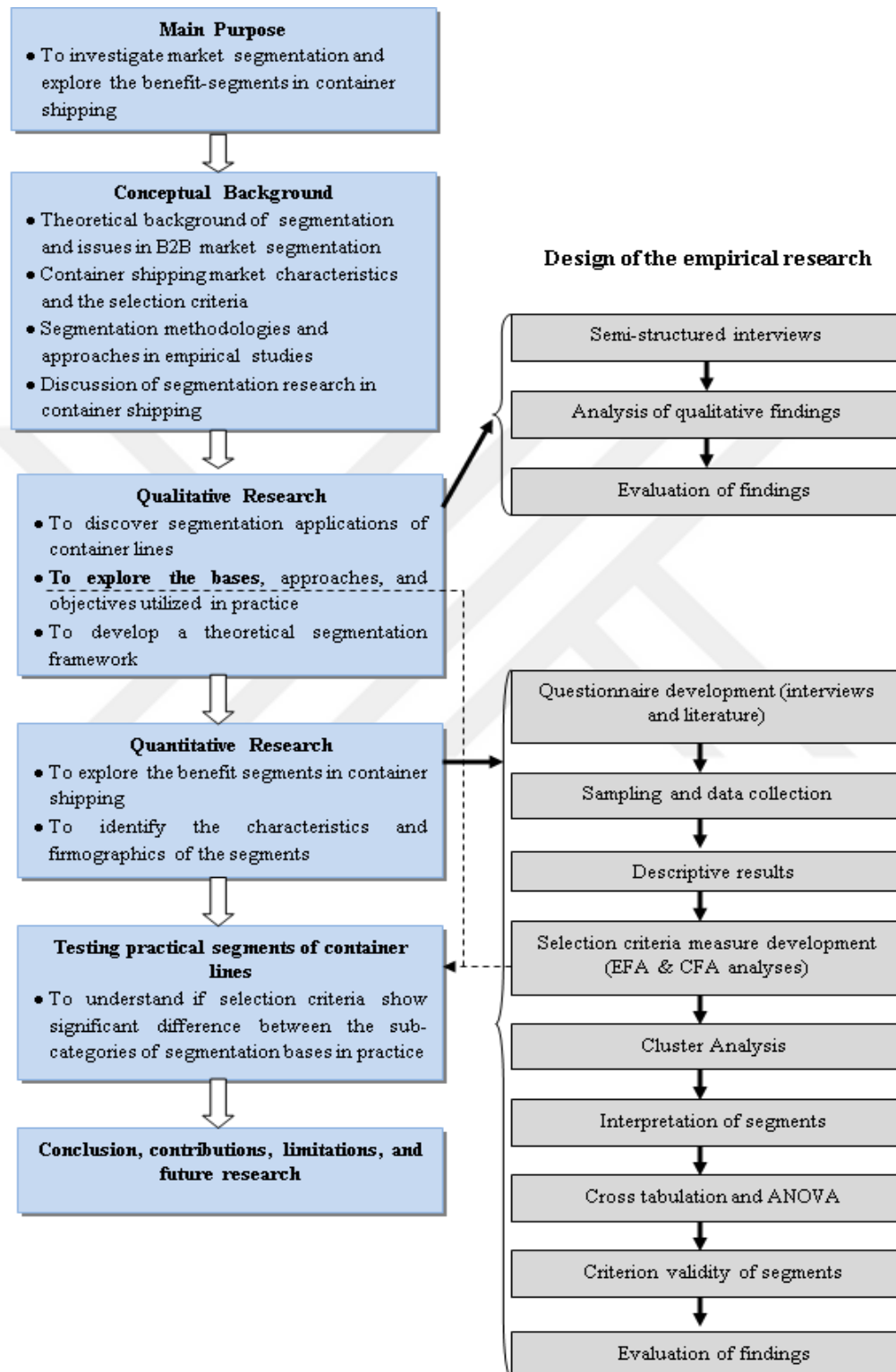
The fourth chapter consists of three main parts. The first part is a qualitative study to understand the segmentation approach container lines adopt, the bases they use, and the objectives they aim when segmenting the market. Semi-structured interviews are conducted with 20 container lines in Izmir. The qualitative study not only reveals what, why, and how container lines do in market segmentation, but also creates a theoretical market segmentation framework that container lines can adopt.

The second part of the Chapter 4 conducts a quantitative study to explore the benefit segments in container shipping market. A survey research is conducted on shippers in Aegean Region of Turkey. Prior to the survey research, another set of semi-structured interviews are conducted for designing the survey questions. Selection criteria measure is developed by exploratory and confirmatory factor analyses. Then, cluster analysis is conducted by using the factor scores of selection criteria. The six segments are analyzed in terms of their expectation in selection criteria and their firmographics such as size, industry, destination, cargo value etc. Criterion validity of the segments is ensured. A summary of the segments is provided, and a detailed discussion is delivered at the end of quantitative study.

The last part of the fourth chapter investigates if the market segments of container lines in practice in Izmir are effective in understanding differentiated selection criteria or not. A brief comparison is provided between benefit segments in the quantitative analysis (post-hoc approach) and the segments used in practice (a-priori approach). Finally, a conclusion, contributions to literature and practice, and research limitations and future research are presented.

Figure 1 illustrates the objectives and summarized content of each step in the thesis as well as the process of the qualitative and quantitative researches.

Figure 1: Research Process of the Thesis



CHAPTER ONE

AN INTRODUCTION TO SEGMENTATION IN BUSINESS-TO-BUSINESS MARKETS

This chapter provides a brief introduction to market segmentation concept with a focus on B2B markets. The chapter first evaluates the theoretical roots of market segmentation in the literature. Then, it illustrates the evaluation of market segmentation in the development of marketing discipline. The literature suggests that B2B market characteristics are different than consumer markets. Thus, the chapter proceeds with the characteristics of B2B markets especially in services since the container shipping is a B2B service. Finally, the chapter touches upon the fundamental issues in B2B market segmentation.

1.1. THEORETICAL BACKGROUND OF MARKET SEGMENTATION

Market segmentation has been one of the most basic topics in marketing for the last six decades. Market segmentation idea has gained wide acceptance not only by academia of marketing but also by companies. Many companies almost in all different type of businesses segment their customers. In fact, even non-profit organizations apply market segmentation on donators as a part of their marketing strategy (Cermak, File, & Prince, 1994). Although segmentation plays a significant role in marketing, it is not limited to only marketing discipline. Porter (1985) also indicates industry segmentation as a strategy development tool to achieve competitive advantage.

Market segmentation concept was first propounded in a detailed way by Smith (1956), who based the concept on the theory of imperfect competition. Smith defines segmentation as “*market segmentation consists of viewing a heterogenous market as a number of homogenous markets in response to differing product preferences and varying wants*“. The market segmentation concept is associated with Smith, but the term “segmentation” was previously used by Alderson (1937). Shaw (2012) states that Smith was a colleague of Alderson at “Alderson and Sessions” consulting firm and he was highly influenced by Alderson. Earlier, Frederick also suggested five factors to define a component market in his book “industrial

marketing” in 1934 (Mitchell & Wilson, 1998). These five factors are industry, product use, geographic location, the channel of distribution, and company buying habits. Frederick does not name this division of industrial markets as segmentation, but the logic is very similar.

Smith (1956) refers to the researches of Robinson (*The Economics of Imperfect Competition*, 1933) and Chamberlin (*The Theory of Monopolistic Competition*, 1933) as the origin of market segmentation concept. These two authors are the leading theoreticians of imperfect competition. Imperfect competition is the key to grasping the theoretical roots of market segmentation. The perfect competition implies that there are a large number of buyers and sellers in the market and all the products offered by suppliers are identical. The theory of perfect competition suggests that the supply and demand are homogenous: each buyer has identical preferences and each supplier has identical products. Imperfect competition, on the other hand, indicates that supply and demand are actually heterogenous in the real marketplace. Price is not the only determinant for the sensitivity of customers to shift from one product or company to another (Kaldor, 1934).

A diversity exists in supply side because production equipment, methods, and processes are different; inequality occurs among suppliers regarding the share of specialized and superior resources; and differences exist for design, production, and improvement processes of products (Smith, 1956). The resource-based theory of the firms also suggests that the resources of the firms can be differentiated than the competitors’ (Peteraf, 1993; Wernerfelt, 1984). Diversity exists in demand side since needs and wants of the customers may vary. The diversity in needs and wants may arise due to the differences in characteristics of customers such as age, sex, income, education level, culture, religion, and lifestyle etc. The theory of consumer choice supports this diversity in consumer preferences. The theory suggests that consumers try to maximize the utility from a good or service and the utility does not depend on only the price and income but also changes in taste (Michael & Becker, 1973).

Hunt and Arnett (2004) grounds market segmentation strategy in resource advantage theory. They argue that resource advantage theory is a concrete base for market segmentation since it elucidates the demand heterogeneity in the market, why firms market different offerings, and how market segmentation strategy can lead to

superior financial performance. Similarly, some of the key issues of the resource-based view of the firm constitute a strong base for market segmentation (Wernerfelt, 1984). These issues are deciding the resources of firms that diversification should be based, determining which resources to be developed, choosing the frequency and markets for diversification.

Segmentation, together with differentiation, is one of the oldest and most fundamental strategies in marketing (Shaw, 2012). In terms of marketing schools of thought, segmentation is evaluated under “*marketing management school*”. In addition to segmentation, this school of thought also includes the “marketing mix” and “customer orientation” strategies (Shaw & Jones, 2005). The main concern of marketing management school is to answer the question of “how should companies market their products to customers?”. Most studies and ideas of this school of thought started in the 1950s and 1960s. Modern marketing thought also emerged during this time period. The focus of marketing shifted from the only production and selling to needs and wants of customers (Webster, 1988). The idea of market segmentation has been adopted by both academics and practitioners since it is compatible with modern marketing thought. Philosophy of market segmentation puts the customer in the center just as the modern marketing thought.

Smith’s definition of market segmentation has also evolved in parallel to modern marketing thought. The definition has evolved by encompassing buying behaviors and psychographics in addition to preferences and wants, and the marketing mix instead of the product alone in response to different segments (Shaw, 2012). Weinstein (2004, p.4) defines segmentation as “*The process of partitioning markets into groups of potential customers with similar needs and/or characteristics who are likely to exhibit similar purchase behavior*”. Kotler and Armstrong (2012, p.49) more recently define market segmentation as “*The process of dividing a market into distinct groups of buyers who have different needs, characteristics, or behaviors, and who might require separate products or marketing programs*”. Though a significant number of definitions by different authors exists, the definitions are very similar to each other.

Market segmentation brings several benefits to organizations depending on their purpose. The benefits, in general, are better understanding of needs and wants

of customers, more efficient allocating of resources, developing of specific products or services and promotional strategies, implementing differentiated and effective marketing mix, exploring potential new markets, and determining target markets (Dibb, 1998; Kotler and Armstrong, 2011; Rangan, Moriarty, and Swartz, 1992; Weinstein, 2004). Organizations can implement more precise profitability analysis of different customer groups through market segmentation by calculating the cost of marketing efforts and revenue in each segment (Beik and Buzby, 1973). Differentiation strategy based on different segments can lead companies to gain premium charges and competitive advantage (Porter, 1985). Creating appropriate customer segments may also help to apply successful price discrimination between different segments (Narasimhan, 1984). In sum, market segmentation provides substantial benefits in terms of marketing, strategy, and management perspectives.

The benefits of market segmentation are well documented and abundant in the literature. However, since the marketing thought has been constantly evolving, the idea of market segmentation may be challenged with the current marketing concepts such as mass customization and relationship marketing. Is market segmentation still useful in the current marketing context? We should find the answer by evaluating the development of marketing discipline and market segmentation together in the next part.

1.2. EVALUATION OF MARKET SEGMENTATION CONCEPT IN THE DEVELOPMENT OF MARKETING DISCIPLINE

Marketing discipline has evolved significantly regarding its focus and perspective for many decades. The evolution is actually still in progress as the market changes constantly. Kotler and Keller (2012) divided the evolution of market into five: Production concept, product concept, selling concept, marketing concept, and holistic marketing concept. In production concept, companies focus on achieving low cost production and distribution. Consumers choose the products which are available and cheap. In product concept, consumers prefer the ones which have better quality, features, and performance, but companies are too much focused on their product, and they neglect other functions such as selling and distribution. Selling concept means that sellers endeavor to sell what is produced by their companies.

Marketing concept means that companies produce what customers need and want, create and deliver the value to customers. Pioneering paper of Levitt (1960) named “Marketing Myopia”, published in Harvard Business Review, is one of the leading contributors of this approach. He states that the reason why companies lose their market share or why their business declines are not because their industry is declining or saturated, but because the management fails to reveal what their customers need and want properly. For instance, railroad transportation companies lost the majority of their business to other modes of transportation alternatives not because of the industry is declining but instead, they did not define the needs and wants of customers well. What their customer needed was not railroad transportation, but transporting their goods and travelling in a faster, more frequent and more reliable way. Holistic marketing acknowledges complexity of marketing and includes: “relationship marketing, integrated marketing, internal marketing, and performance marketing” (Kotler and Keller, 2012: p.19).

Another approach of the evolution of marketing discipline belongs to Vargo and Lusch (2004). They divided the evolution of marketing discipline into four periods as shown in Table 1.

Table 1: Evolution of Marketing Discipline

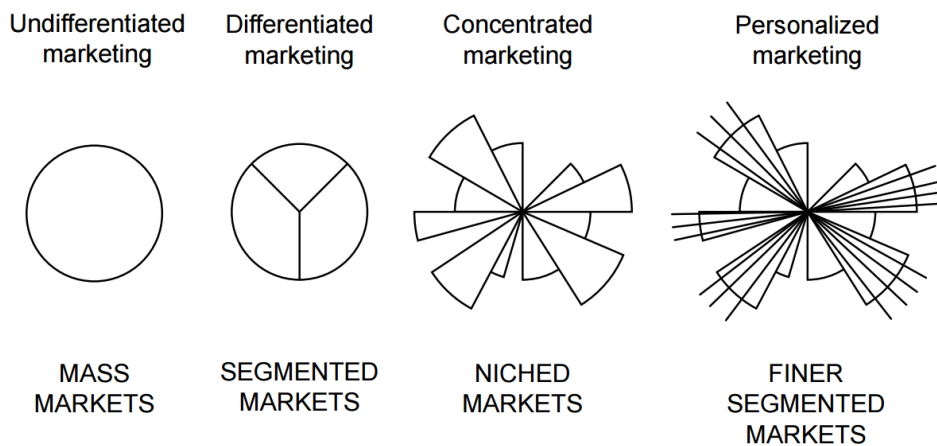
Timeline of period	Fundamental ideas and concepts of the period
1800-1920: Classical and neoclassical economics	• Value creation through manufacturing • Goods are standardized output
1900-1950: Early/Formative marketing	• Commodities, institutions, functional • Classification of goods, the role of marketers' functions, distribution of goods
1950-1980: Marketing Management	• How to market goods to customers? • Market segmentation • Marketing mix • Business should be customer focused • Real needs and wants of customers are key
1980-2000 and Forward: Marketing as a social and Economic process	• Market orientation • Services marketing, • Relationship marketing • Quality management • Value and supply chain management • Resource management • Network analysis • Mass customization

Source: Adapted from Vargo and Lusch (2004)

Until the marketing management period, (it is also the start of modern marketing) marketing academicians mostly dealt with classification of goods, distribution channels, and exchange of goods. The focus of marketing has become the customer since the 1950s, when market segmentation concept was developed. Market segmentation has attracted the attention of academicians and practitioners since it is compatible with modern marketing idea: needs and wants of customers – that show great variety – should be the main focus of businesses.

Among the propositions appeared in the period of 1980-Forward, some defenders of relationship marketing and mass customization (one-to-one marketing, customer-centric marketing) object the idea of market segmentation. Sheth et al. (2000) indicate that customer-centric marketing strategies are to take place of segmented marketing strategies in the current market. They define this emerging concept as “*customer-centric marketing emphasizes understanding and satisfying the needs, wants, and resources of individual consumers and customers rather than those of mass markets and market segments*”. In parallel to this statement, Kara and Kaynak (1997) argue that traditional market segmentation is challenged by mass customization, relationship marketing, and micromarketing. They suggest finer market segmentation instead of the traditional one as illustrated in Figure 2.

Figure 2: Development of Marketing Progress



Source: Kara and Kaynak (1997)

Similarly, Firat and Shultz (1997) assert that postmodernism has influenced the marketing and buying behavior of consumers significantly. They stated that the

market is now fragmented due to postmodernism, and therefore “*conceptualizing the consumer as a member of a relatively homogeneous market segment is increasingly difficult*” (Firat and Shultz, 1997).

Relationship marketing approach also objects to market segmentation concept. A statement of Grönroos (1999) – a leading relationship marketing researcher – explains how relationship marketing argues against market segmentation.

“In relationship marketing, marketing decisions and activities cannot be based on traditional segmentation techniques. Choice of customers to serve and decisions about how to serve them must be based on individual customer information files and other sources of data”.

We acknowledge the importance and validity of one-to-one marketing and relationship marketing as a necessity in the current marketing paradigm. We also understand the arguments against segmentation, but segmentation does not necessarily contradict to these two concepts. Segmenting the market, from the perspective of this thesis at least, does not mean providing the same marketing offering to each member. Segmentation can be an effective first step for mass customization. Jiang (2000) also suggests that mass customization is a part of market segmentation and it should not be seen as an alternative to market segmentation. Instead, Jiang offered “segment-based mass customization” to satisfy the personalized needs of customers.

Segmenting the market is not also contradictory to relationship marketing. It can help to identify each customer’s characteristics (needs and wants, profitability etc.) based on the segment and help companies in applying relationship marketing more effectively. For instance, Elliott & Glynn (1998) segmented the financial market based on the value of customers, relationship profitability in other words, for more effective relationship marketing.

Market segmentation is also compatible with some current marketing perspective. In a very recent study, Kumar (2015) suggests that resource-conscious view – which focuses on the profitability of customers and resources of organizations for more effective marketing – is a current issue in marketing. This approach

necessitates understanding needs and wants of customers, determining the appropriate communication, identifying value and profitability of each customer, and using marketing resources more effectively. Segmenting the market can help to achieve these concerns. Quinn et al. (2007) also support the argument by indicating that segmentation help organizations to allocate their resources more effectively.

Another contemporary concept of marketing is to create superior value for the customer. Ulaga and Chacour (2001) investigated customer perceived value in business markets and stated that different segments have different value perceptions over a same product. Firms should find out the how different each segment score the weight of value determinants.

Many current studies also still investigate market segmentation (Chen et al., 2017; Lierop and Geneidy, 2017; Thomas, 2016) Hence, we claim that segmentation is still necessary for today's marketing discipline although the approach of how to deal with segments and individual customers may have changed. However, the approach of dealing with customers in market segmentation highly depends on if it is a business market or consumer market as well as if it is a services market or product market. Since our application is on a business-to-business service, we need to briefly explain these two distinctions.

1.3. B2B SERVICES MARKETING

1.3.1. B2B Marketing

Business-to-business marketing strategies are designed differently than consumer marketing as certain differences exist between two market types. Webster (1984) indicated that industrial customers are different than consumers in terms of the number of customers, demand structure, and buying behavior. B2B customers are relatively fewer in number but their purchases are quite large in terms of quantity and monetary value. B2B customers have derived-demand as they produce, process, or resell the products or services. Buying process in a B2B market is more complicated and prolonged, and requires more than one person, usually from different departments, to make a decision.

Webster also touched upon distinctions in regard to product complexity of B2B market with a comparison to the consumer market. Products vary as heavy equipment, light equipment, raw materials, and processed material etc. which usually requires technical assistance from suppliers (Webster, 1984). Suppliers and customers are interdependent as it can easily be noticed in the rapid development of supply chain systems. Price of products or services is usually subject to negotiation or discounts can be available in large volume purchases. Vitale et al. (2010, p.41) list a total of twenty-three differences between B2B and consumer marketing under eight main themes: market structure, products, buyer behavior, buyer-seller relationship expectations, channels, promotion, price, and demand. All these dissimilarities between the two market types compel different approaches in basic concepts of marketing such as marketing mix or require an entirely new approach like relationship marketing.

Buying behavior in B2B firms is quite complicated and affected by several external and internal factors. Webster Jr and Wind (1972) specify four general variables that include many sub-variables affecting organizational buying behavior: individual, social, organizational, and environmental. Another model developed by Sheth (1973) also indicates a significant number of internal and external factors influencing the decision of industrial buyers. Product specific factors, company-specific factors, expectations of different persons within and outside of the organization, psychological world of decision makers and situational factors are among the variables affecting the decision of buyers. These are environment, organization, buying center, and individual participants. Since business buyer demand is a derived demand, buying decision takes several rational steps and is influenced by several departments inside and outside of the buyer's organization to ensure best value is achieved. Though industrial decisions are assumed to be rational and task-oriented, irrational and individual motives can also affect the decisions in many cases (Sheth, 1973; Webster Jr and Wind, 1972).

1.3.2. Services Marketing

Importance of services in marketing has been rapidly increasing. First studies of services marketing in the 1970s and 1980s were mainly about to illustrate the

difference between services and products and to prove a necessity of an entirely new approach for marketing of services (Brown et al., 1994). Later, service marketing has become one of the most popular research areas of marketing. Vargo and Lusch (2004) also claim that the focus of marketing is shifting from tangibles to intangibles and propound services as the new dominant logic in marketing.

Services have unique characteristics that separate them from products. Grönroos (1982) indicate that services have at least three characteristics different than products: physical intangibility of service, services being activities rather than things, and simultaneity in production and consumption. Zeithaml et al. (1985) also state the differences of services as intangibility, the inseparability of production and consumption, heterogeneity, and perishability.

Specific characteristics of services lead to some specific problems that require particular marketing strategies for service companies. The most commonly agreed characteristic of services different than goods is their intangibility. Zeithaml et al. (1985) state that intangibility causes some specific problems: services cannot be stored, they cannot be protected through patents, they cannot be readily displayed or communicated and their prices are difficult to set. Solutions proposed by them based on their literature review to cope with these problems are stressing tangible cues, using personal sources more than non-personal sources, simulating or stimulating word of mouth communications, creating a strong organizational image, using cost accounting to help set prices and engaging in post-purchase communications.

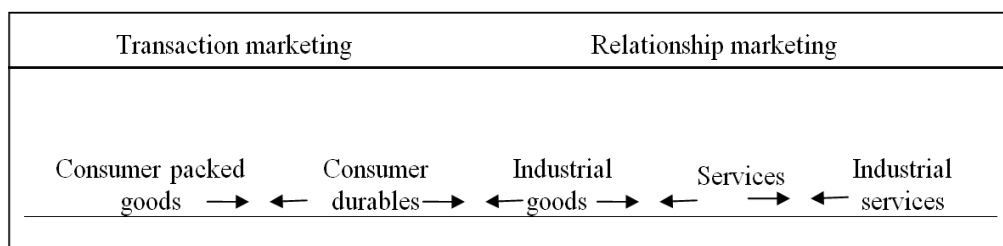
Service quality generates the central frame of service marketing literature. Gummesson (1978) states that service quality in professional services is a subjective issue. Service quality is more difficult for customers to evaluate compared to the quality of tangible products. Some authors attempt to reveal the determinants of service quality. Grönroos (1982) suggests that corporate image, technical quality, and functional quality are the three determinants of total quality in services. Parasuraman et al. (1985) explored a total of ten determinants of service quality: Reliability, responsiveness, competence, access, communication, credibility, security, understanding the customer, and tangible. These ten dimensions were reduced to five as tangibles, reliability, responsiveness, assurance, and empathy. Gronroos (1988) found professionalism and skills, attitude and behaviour, accessibility and flexibility,

reliability and trustworthiness, recovery, and reputation and credibility as the six criteria of service quality.

1.3.3. B2B Services Marketing: Importance of Communication and Relations

B2B services represent both unique characteristics of service marketing, e.g. intangibility and inseparability, and industrial markets, e.g. buyer and seller interdependence, product complexity, and buying behaviour. Buyer and sellers relationship should be core focus rather than products in industrial marketing, especially in industrial services where no tangible product exists for customers to evaluate (Webster, 1984). Grönroos (1994) also states that relationship marketing is more appropriate in industrial goods and services as illustrated in Figure 3. We also added industrial services to the figure. Matthyssens and Vandenbempt (1998) found relational marketing skills as an important contributor to creating customer value in industrial services.

Figure 3: Marketing Approaches for Different Market Types



Source: Adapted from Grönroos (1994)

Understanding the needs and wants of customers, their business, and value systems and to make customers realize these efforts are the key for building long-term relations (Grönroos, 2004). The efforts to make customer realize this can be achieved by effective communication strategies. Marketing communication is one of the important concepts that require special attention in B2B marketing (Gilliland and Johnston, 1997). Communication helps industrial marketers to make the buyer aware of the supplier, to persuade the buyer to purchase during the negotiation, and to keep

the commitment of the buyer to the supplier (Andersen, 2001). Webster (1984) too stated how the personnel and communication are influential in the marketing of industrial services. In parallel, Sharma and Patterson (1999) found that communication positively influences functional quality, technical quality, trust, and eventually relationship commitment in professional services. Communication, especially through dialogue, plays a crucial role in satisfying customer needs in relationship marketing context (Grönroos, 2004).

In B2B marketing, personal selling is a basic means of communication. In personal selling, the salesperson can collect necessary information about customers, stress the strong feature of their products or services that meet the expectation of customers, tailor services for each customer, and adjust marketing message based on the expectations and buying behaviour of customers. Personal selling and communication are important factors affecting the perceived service quality (Parasuraman et al., 1985) of buyers for industrial services where tangible materials are limited for buyers to evaluate. Crosby et al. (1990) named salespeople in the marketing of complex services as “*relationship manager*”. Therefore, the quality of interaction between salesperson and customer can be as important as the quality of service in industrial services.

1.4. MARKET SEGMENTATION IN B2B MARKETS

The peculiar characteristics of B2B markets, e.g. complex buying behaviour, number of buyers and sellers, derived demand, and complicated buyer-seller relations, call for a special attention of segmentation in B2B markets. B2B market segmentation is considered to be more complicated compared to consumer markets (Boejgaard and Ellegaard, 2010; Dibb and Simkin, 1994; Dibb and Wensley, 2002; Plank, 1985). Boejgaard and Ellegaard (2010) listed six reasons behind this situation and the main points they stated are: customers directly state their own particular, which are also heterogonous, because of constant communication; the interaction between buyer and seller complicates “*stimulus-response*” pattern; buyer-seller relations and offerings are more complex, and segments tend to behave more unstable.

Dickson (1994) states that B2B segmentation differs from consumer segmentation since market segments are more unstable and more susceptible to market developments. Johnson and Flodhammer (1980) also claim that industrial markets need a specific segmentation model due to the more complex decision-making process. Wind and Cardozo (1974), on the other hand, argue that industrial segmentation and consumer segmentation do not need to be treated as two distinct areas. The only difference they stated is the particular bases to be used in segmentation. Yet, we should note that the choice of bases plays a central and critical role in segmentation research.

Another argument is raised by Dibb and Wensley (2002) who indicate that segmentation research in B2B markets usually moves more slowly than consumer markets. They listed the reasons as buying decisions that occur in buying centre are more complex; accessibility of business markets is tough, no agreement is reached regarding the segmenting variables, and buyers in B2B markets are more heterogonous. Freytag and Clarke (2001) also touched upon the fact that B2B segmentation research lags behind consumer segmentation research.

The specific characteristics and challenges of B2B segmentation also require a distinct definition. Although the literature highlights the dissimilarities between consumer and B2B segmentation, most authors do not use a specific definition for B2B market segmentation. Mitchell and Wilson (1998) attempted to define the B2B segmentation as *“Business-to-business market segmentation is an ongoing and iterative process of examining and grouping potential and actual buyers with similar product needs into subgroups that can then be targeted with an appropriate marketing mix in such a way as to facilitate the objectives of both parties. The process has strategic and tactical marketing implications and should be periodically reviewed to incorporate the lessons of experience and to maintain an optimal cost /benefit ratio”*. Although other industrial segmentation scholars provide a definition in their papers, they do not specify if it is a specific definition for the industrial market context.

Goller et al. (2002) reviewed the literature on B2B segmentation and stated that four main areas are frequently discussed.

- “the development of segmentation bases and models”

- “research methodologies in terms of data requirements and data collection”
- “the development and applications of statistical analysis”
- “the implementation of segmentation into strategy”

Indeed, at least one of these issues is discussed in almost all segmentation studies. This dissertation will also attempt to address these issues when segmenting the container shipping market.

Upon revealing the specific characteristics of B2B markets, some special issues of B2B segmentation need to be underlined. The literature mentions several issues and this thesis mentions the most prominent ones. The issues disclosed here are actually related to each other that they cannot be separated from each other. Yet, for the sake of easiness to elucidate the topic, the issues are described separately.

Choice of segmentation bases

The first important issue is the choice of segmentation bases. The success of segmentation highly depends on the success of choosing the most appropriate bases. Choosing the right bases is actually a critical art that affects the entire segmentation process. Choice of right bases depends on several factors. Wind and Thomas (1994) state that selecting the most appropriate bases depend on the objectives and managerial decisions of firm. They suggest that a firm should choose different bases when they decide on a new product, develop positioning strategy, implement effective pricing, and explore marketing decisions.

The choice of bases should also be decided considering the requirement of the industry in which the researchers or companies carry out market segmentation. In other words, as Goller et al. (2002) also underline, choice of bases should be industry-specific. This argument is quite logical considering the fact that many industries have their individual characteristics in terms of number of buyers and sellers in the market, competition level and structure, product features, whether it is service or product industry, and whether it is a mature or growing industry. It is very reasonable that a software development company that creates accounting solutions and an iron ore mining company utilize different bases.

Strategic goal and resources of segmenting company

Another important issue is the strategic goals and resources of companies. The researchers and B2B marketers should take the goals and resources of companies into consideration if a segmentation to be successful. Yet, in most cases, the researchers in market segmentation ignore strategic importance of segmentation and attempt to provide an idealistic segmentation technique that only focuses on customer needs (Clarke, 2009; Mitchell and Wilson, 1998). Johnson and Flodhammer (1980) clearly indicate situation as *“segmentation may be more of a problem resource allocation than of measuring, calculating, and statistical analysis”*. Mitchell and Wilson (1998) also criticize the idealistic studies, and recommend that segmentation studies should not only focus on needs and wants of customers, but also strategic objectives of companies such as investment priorities.

The importance of strategic considerations is mentioned by several authors. When illustrating the steps of segmentation selection process, Freytag and Clarke (2001) put “resources” section at the second step. They recommend that a company should consider whether they hold necessary resources to meet customer demands of a segment. Clarke (2009) indicates that a thorough segmentation program can be accomplished by a strategic segmentation that includes segmentation objectives and resources of the company. Wind and Cardozo (1974) also state how segmentation is critical for marketers to allocate their strategic resources more efficiently.

In B2B marketing, profitability of each customer varies significantly. Unlike consumer markets, a few customers in B2B markets can comprise majority of the sales. Remembering the fact that resources of a company are limited, companies strive for efficient allocation of company resources among customers. Thus, in parallel to what literature suggests, customer needs and wants should not be the sole concern of segmentation. A segmentation study should also evaluate the strategic importance of each customer.

Although the above criticisms about the ignorance of strategic concerns are correct, the strategic decisions are company-specific and scholars need to conduct their segmentation studies based on a single company, which is not possible in most

cases. Nonetheless, instead of proposing a rigid and certain solution, a segmentation study should acknowledge the importance of strategic goals and resources of companies and give a flexible space for companies in an industry to adopt the segmentation solution according to their objectives and resources. A segmentation study should examine both the needs and wants of customers as well as strategic importance of customers and resources of the segmenting company.

Implementation problem

Market segmentation is one of the most fundamental topics that pervades in marketing research including B2B studies. Yet, implementation problem is the most prominent issue considered in B2B market segmentation (Boejgaard and Ellegaard, 2010; Kalafatis and Cheston, 1997). Segmentation has been studied by many academics. Scholars have proposed advanced segmentation analyses and models, but these models usually are not applied in practice. 43 years ago, Wind and Cardozo (1974) stated that “*our research indicates industrial marketers by no means use market segmentation strategies as widely or as effective as they might*”. Boejgaard and Ellegaard (2010) investigated the implementation problem of market segmentation in industrial segment context in detail. They reviewed the literature review papers of B2B market segmentation that cover over 30 years of time period. At the time they conducted the study, they found that implementation was still underdeveloped.

Authors in the literature have propounded several reasons behind the implementation problem. One of the reasons Plank (1985) stated that the literature ignores the budget required to accomplish market segmentation program. Wind and Thomas (1994) indicated several difficulties that result in implementation problem. The difficulties they mention include identifying correct communication channels, cost and complication of creating customized messages, and modification of distribution and sales organization. Goller et al. (2002) claimed that lack of market orientation of companies can lead to failure of putting theory into practice in segmentation.

Hoek et al. (1996) argued that market implementation problem is common because segmentation studies in the literature lack of objectivity. A shortcoming in objectivity causes a major problem because segmentation analysis has several methods and each of the methods used may provide different solution. Thus, according to Hoek et al. (1996), selection of a method inevitably leads to subjective results in segmentation.

Boejgaard and Ellegaard (2010) investigate the implementation problem of B2B segmentation in detail. The authors study a total of 45 academic articles with a segmentation implementation. They find that organization, motivation, and adaptation are the key reasons causing the implementation problem. Organization structures are difficult to change to conform the new structure that segmentation program necessitates. The authors argue that no matter how qualified the marketing personnel are, if they do not understand and embrace the purpose of market segmentation well, it is likely that the segmentation will fail. Thus, increasing the motivation of personnel is the key. The adaptation problem they refer is the difficulty to adapt changes in customer requirements and collect information constantly.

Dibb and Simkin (2001) state that three barriers obstruct the accomplishment of segmentation: infrastructure barriers, segmentation process issues, and implementation barriers. Clarke (2009) state that a gap exists between theory and practice because not all members in marketing department join the development of a segmentation strategy. This causes marketers to have lack of belonging feeling towards the segmentation program, which eventually causes implementation problem. Thus, they suggest that companies that apply market segmentation should involve all participants of marketing so that each person can embrace the segmentation program of the company.

Scholars usually recommend usage of micro bases that concern needs and wants of customers. Yet, industrial marketers prefer using more basic macro bases such as geographic location and industry. Therefore, a segmentation model that is based on needs and wants of shippers but also address the concerns of industrial marketers by utilizing macro variables. By this way, the segments can be identifiable and accessible, which eventually enables industrial marketers to take action.

CHAPTER TWO

CONTAINER SHIPPING AS A B2B SERVICE

Container shipping is a complex B2B service in terms of the parties involved, the complicated business process, and the development of market structure. This chapter aims to explain the characteristics of container shipping market and investigate marketing discipline and customer value concept within container shipping domain. When explaining the market structure and competition level in the market, the chapter first evaluates the conferences, which prevailed until 2000s in the market, and strategic alliances which have been very common in the last three decades. Then, competition level in the market is discussed. Marketing in container shipping is explained in three sections. The first section attempts to demonstrate the characteristics of the service. The second section discussed the customer value in container shipping. Finally, the last section discusses the service quality and selection criteria in container shipping.

2.1. CONTAINER SHIPPING MARKET: CHARACTERISTICS, DEVELOPMENT, AND CURRENT ISSUES

Container shipping is an important member of liner shipping industry which also includes passenger and Ro-Ro transportation. Liner shipping carriers have regular and scheduled services between pre-determined ports. Haralambides (2007) thinks liner shipping resembles public transportation of passengers which is regular and scheduled and leaves a station regardless if the bus is full or not. Sys (2009) defines the container shipping industry as *“This industry operates vessels transporting containers with various but standardized dimensions/size, regardless of the contents. Whether filled or not these vessels are put into service on a regular basis and often according to a fixed sailing schedule, loading and discharging at specified ports”*.

Great number of different types of manufactured and semi-manufactured goods – and even raw materials recently such as coal and grains – are carried in containers. The variety of cargoes is even expanding as container shipping keeps

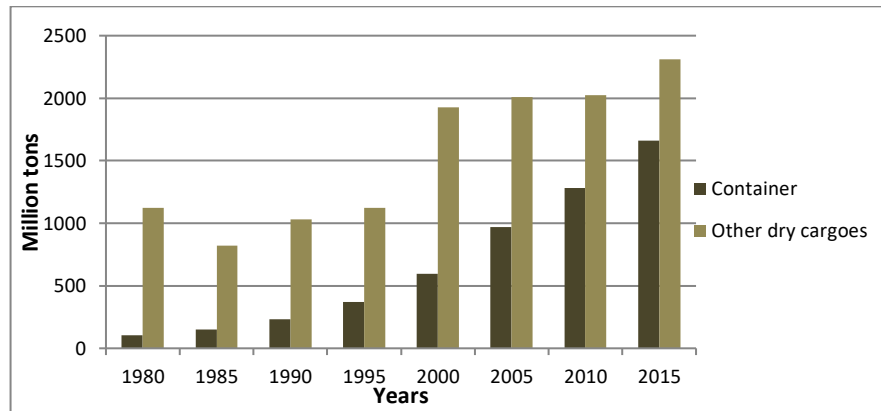
capturing cargoes from other types of shipping e.g. reefer containers has achieved a great share from traditional reefer vessels (Arduino et al., 2015). This results in a vast diversity of customers in terms of industry and size.

Until the invention of container transportation by McLean in 1956, general cargoes were transported regularly by general cargo vessels. Container transportation has dramatically increased since its invention. The significant rise of containerization, as shown in Figure 4, lies on the benefits it has brought to global economy. Transporting, handling and stowing of general cargoes was time consuming, costly, and relatively unreliable since they were used to be carried in parcels such as in pallets. Containerization has enabled:

- faster loading and discharging of cargo with less labour requirements
- a decrease in overall transportation costs
- safer transportation
- more reliable (timely) transportation
- economies of scale

These benefits of containerization generated advanced logistics systems such as just-in-time. Containers have allowed intermodal transportation of cargoes in a convenient way. Containerization also plays a crucial role in the development of globalization through its ability to move cargoes at lower cost but with more reliability.

Figure 4: World Seaborne Containerized and Other Dry Cargo (Dry Cargoes Other Than 5 Major Bulks) Trade in Million Tons.



Source: Derived from UNCTAD (2017)

An important characteristic of container shipping industry is its high fixed cost. The regularity of service regardless if the vessel is full or not causes high fixed cost in the industry (Tang, 1994). The high cost of specific large container vessels also boosts the high fixed cost structure of the industry. Container shipping is also a quite international business that has many different trade routes both in regional and inter-regional base. International feature of container shipping also implies that carriers are subject to complexity in business law and regulation.

Container shipping has faced serious challenges especially in the last two decades due to escalating competition, changing legal and market environment, rising costs and increasing customer expectations. We explain the most prominent ones here, but Lau et al. (2013) lists research topics in container shipping if interested.

Increasing vessel size and hub-and-spoke system

Carriers prefer to invest in larger size container vessels to utilize economies of scale (Cullinane and Khanna, 2000) and decrease emissions per TEU (Twenty-foot equivalent unit) . The increase in containership size is so dramatic: In 1968, the container carrying capacity of MV Alster Express was 765 TEU (Wijnolst and Wergeland, 2009), but the biggest container vessels in 2018 are over 22.000 TEUs.

Though this giant vessels bring vast cost advantages for carriers, some reports in the market imply the concern of shippers regarding inflexibility and lack of service frequency that giant container vessels cause (Murnane et al., 2016). An increase in the number of larger container vessels is likely to occur due to Panama Canal expansion as well. The canal, which used to welcome around 4500 – 5000 TEU vessels, can now accommodate vessels with capacity of around 10.000 -12.000 TEU.

Rise in container vessel size also requires hub-and-spoke system which basically means using larger vessels between hub ports and smaller vessels from/to feeder and hub ports. Carriers pay a lot of effort to design their network type (multiport or hub-and-spoke), optimum vessel size and empty container repositioning (Imai et al., 2009). Many global operators focused mostly on the trade between hub ports, and this helped some regional container shipping companies, such as Arkas and Wan Hai, to grow significantly in recent years.

Container terminals

Container terminals have been developing in parallel to container shipping. Cargo handling equipment is adapted for loading, discharging and moving containers following the recent trends. Container terminals invest in larger gantry cranes and increase drafts by dredging to accommodate large container vessels. Automated terminals are also becoming common in different geographies. The terminals benefit notably from hub-and-spoke system which causes more cargo handling. Some global lines such as Maersk, MSC and COSCO also invested in container terminal business to create a vertical integration.

Door-to-door transportation and vertical integration in container shipping

Outsourcing strategies led shippers to demand one-stop-shopping solutions from container lines. Since containerization allowed intermodal transportation, door-to-door solutions became practicable. Container lines carried out vertical integrations with container terminals and trucking organizations.

2.2. MARKET STRUCTURE AND COMPETITION IN CONTAINER SHIPPING

The market structure and competition in liner shipping has changed since its early time in the second half of 19th century. The unique characteristics of liner shipping – necessity of regular service and high fixed cost – have obliged lines to cooperate with other lines in different forms. The most common type of cooperation was liner conferences (specific cartel agreements between lines) until the late 20th century, but now the prevailing cooperation types are strategic alliances and vessel share agreements (VSA). The competition in liner shipping has also shifted from collective monopoly to oligopoly (Tang, 1994).

2.2.1. Conferences and Strategic Alliances in Liner Shipping

Liner conferences commonly existed for over a century since the first liner conference between Britain and Calcutta in 1875 (Stopford, 2009). Convention on a Code of Conduct for Liner Conferences defined liner conferences as *“A group of two or more vessel-operating carriers which provides international liner services for the carriage of cargo on a particular route or routes within specified geographical limits and which has an agreement or arrangement, whatever its nature, within the framework of which they operate under uniform or common freight rates and any other agreed conditions with respect to the provision of liner services”* (UNCTAD, 1975). Liner conferences apply several measures to restrict competition among conference members as well as between the conference and outsiders. First, conferences fix the price of carriage so that a conference member cannot charge more or less than others. Second, capacity (supply) for a specific route is adjusted against demand volatility. Third, conferences utilize fighter ships to fight against outsiders that try to enter the market. Conferences also sign loyalty contracts with shippers to prevent entry of another line to the route (Tang, 1994).

Conferences fix different prices for each type of commodity and publish a “tariff” indicating freight rate of each commodity for the same route (Jansson and Shneerson, 1987). Price discrimination was easier before containerization as different

commodities needed different stowing and cargo handling. However, conferences implement price discrimination between various products based on their value, in other words, based on the price elasticity of customers. Tang (1994) state that lines used to apply discrepant freights (up to 20 times) for some commodities with same physical characteristics, e.g. fragility and shape, but unequal values. This price discrimination is usually phrased as “charging what the traffic can bear” (Jansson and Shneerson, 1987).

Container lines found other alternative agreements since 1970s because of several reasons (Sjostrom, 2010). First, containerization rose suspicion on necessity of tariff system since stowing and handling of cargoes have become identical. Second, new competition legislations have lifted antitrust exemption of liner conferences. Conferences were allowed because a price competition would lead to a destructive competition in the market. Since authorities believed (e.g. Royal Commission on Shipping Rings 1906 in Britain and Shipping Act 1916 in the USA) that shipping lines contribute significantly to society by providing regular services and considering the high cost structure of market, conferences were exempted from antitrust law (Brooks, 2000; Jansson and Shneerson, 1987). However, current legislations caused conferences to erode gradually. First, Shipping Act of 1984 in the USA brought free entry of any company to operate a liner service or join or exit a conference as well as agreements directly with shippers can be done individually. However, this act did not work very effectively for ensuring individual agreements between shippers and liners and abolishing price fixing (Reitzes and Sheran, 2002). Then, Ocean Shipping Reform Act 1998 (OSRA) in the USA dictated that members of a conference can have individual contracts directly with shippers instead of a common agreement between the shipper and all conference members. Finally, Regulation 906/2009 of European commission, block exemption for liner “consortia”, excluded price fixing role of conferences but allowed liners to have technical and operational cooperation to make their services more efficient.

Changes in customer expectation and market environment have also override the conference rules. Global shippers, with various production and distribution centers in several locations, expect more customized services from shipping lines (Reitzes and Sheran, 2002). Shipping lines have also become more willing to

establish direct relations with shippers individually and make customized offers for large shippers. All these developments lead shipping lines to form other kind of cooperative agreements such as strategic alliances, vessel sharing agreements and slot charter agreements.

Several types of strategic cooperation exist in container shipping. These strategic agreements between container lines do not include price fixing or allocation of customers. Container lines carry out marketing facilities individually with customers. Ryoo and Thanopoulou (1999) lists strategic cooperation in container shipping as slot charter agreement, joint service, pooling agreement, consortium, joint venture and strategic alliances. Vessel share agreements can be included in this list as well. In fact, some authors consider vessel share agreements and slot sharing agreements as a kind of strategic alliance (Panayides and Wiedmer, 2011; Song and Panayides, 2002). In practice, in slot charter agreement, a line charters a space in its vessel to another line for a specific route. In vessel share agreement, each line deploys vessels (ratio does not have to be equal) in some routes.

Strategic alliances are very similar to vessel share agreements but their geographical coverage and content of cooperation are usually wider. The most common strategic agreements are related to waterborne transportation but the agreements may also cover inland transportation, port and terminal activities and logistics services (Evangelista and Morvillo, 1999). Strategic alliances also usually exist in busy traffic lines such as Far East – Europe, but they also sign slot charter, vessel share or joint service agreements with other lines in regional trades such as Intra-Mediterranean and Black Sea. The common result of these agreements is that different container lines serve their customers with the same vessels.

Container lines enjoy important benefits through strategic alliance formation. Lu et al. (2006) studied CKYH alliance members and listed the reasons stated by the members. The five important motivations are extending service coverage, providing more frequent services, entering to new routes faster, sharing the risks of providing new liner service, and maximizing operational strategy. In another study, Ryoo and Thanopoulou (1999) found the 5 most important reasons of forming an alliance as: maximizing operational synergy, rationalizing service routes, increasing market share, increasing the utilization of container boxes, and benefiting from economies of

scale. In addition to these benefits, Midoro and Pitto (2000) also added “achieving purchasing power and volume” as an important gain.

However, alliances experience stability problem, and this instability caused several alliances to occur in the last two decades. The first global liner alliances appeared to be Global Alliance (APL, MISC, MOL, Nedlloyd, OOCL) and Grand Alliance (Hapag Lloyd, NOL, NYK Line, P&OCL) in 1996. Maersk and Sealand also created a strategic alliance at that time. By 2009, there were three main global alliances: New World Alliance (APL/NOL, HMM, MOL), Grand Alliance (Hapag Lloyd, NYK Line, OOCL), and CKHY Alliance (Cosco, Hanjin, K-Line, Yang Ming).

Table 2: Strategic Alliances as of 2015

G6 Alliance	CYKHE	2M	Ocean Three
• APL/NOL • MOL • HMM • Hapag Lloyd • NYK Line • OOCL	• Hanjin • K-Line • Yang Ming • COSCO • Evergreen	• MSC • Maersk Line	• CMA CGM • UASC • China Shipping

Source: Derived from various resources

Members of the alliances have changed dramatically until today, not only because alliance instability but also due to mergers & acquisitions. The main mergers & acquisitions are P&O and Nedlloyd, APL and NOL, Maersk and Sealand, Maersk and Royal P&O Nedlloyd. Recently, Hapag Lloyd and CSAV merged in 2015 and Hapag Lloyd and UASC concluded an agreement of a merger in 2016. The alliances in 2015 are illustrated in Table 2, but it changes in the next year due to merger between Hapag Lloyd and UASC, the merger between China Shipping and Cosco in 2016, the acquisition of APL/NOL by CMA CGM, and more developments.

From 2015 till January 2018, Hanjin has bankrupted. China Shipping line has been taken over by Cosco. Hapag Lloyd and UASC has merged under Hapag Lloyd. APL/NOL has been acquired by CMA CGM. HaburgSud has been acquired by Maersk. Table 3 shows the three main global alliances as of January 2018. However, this table will also change in the second half of 2018 because the three Japanese

carriers (NYK, MOL, and K-Line) will merge under Ocean Network Express (ONE). Moreover, there is some news in the market that OOCL and Cosco will merge by late 2018.

Table 3: Strategic Alliances as of January 2018

2M	Ocean Alliance	THE Alliance
• MAERSK • MSC • HMM	• CMA CGM • Cosco • OOCL • Evergreen	• Hapag Lloyd • NYK • Yang Ming • MOL • K-Line

Source: Derived from various resources

2.2.2. Competition Level in Liner Shipping

The market structure and competition type of competition of liner shipping has changed since its beginning. Considering the supply side of the market, strategic alliances and other non-price fixing agreements have taken the places of conferences. In the conferences era, several maritime economists state that the market was monopoly in the routes where conferences had dense presence. Jansson and Shneerson (1987) state that conferences enjoy high degree of monopoly when no competitor exists, e.g. another outsider line, airline industry or tramp shipping. Tang (1994) suggest that the market structure of liner shipping was collective monopoly until the end of World War Two, after when many lines entered into market.

On the other hand, Davies (1986) argues that liner shipping industry has groundings for supporting the theory of contestability rather than monopoly. Davies also states that, albeit existence of arguments for supporting monopoly, those arguments do not explain the absence of monopoly profits in the market. Davies (1986) further explains that no sunk cost exists because lines can easily sell their ships and no substantial entry barrier occurs since the potential new entrants have the same opportunities to reach technology. However, Franck and Bunel (1991) oppose the opinions of Davies regarding easiness of entry. They believe that shippers are

obliged to work with a conference because their switching costs are high due to loyalty contracts. Finally, they concluded that the market will remain a tight oligopoly or even monopoly in some specific routes.

The market obviously indicated significant rationale for monopoly due to anti-competitive behaviour of conferences, but, even if not in strong conferences era, the market now represents oligopolistic characteristics (Tang, 1994). The competition level has increased especially after legislations that abolish or minimize conference facilities. Tang (1994) discussed that the market was oligopoly but heading towards a more competitive structure. However, in a more recent study, Sys (2009) applied Herfindahl-Hirschman Index (HHI) to container shipping and found that container liner shipping industry is an oligopoly.

HHI measures the market share of top 4 or top 8 markets and points out the concentration level of market. In container shipping, the level of market concentration depends on the route. For instance, results of Sys (2009) demonstrate that US containerized trade is a loose oligopoly while Black Sea-Far East is a tight oligopoly. Today, there are over 100 container operators in the world. Below, Table 4 illustrates the market share of Top 10 container operators among all liner operators in the world regardless of the route in 2016 and 2018.

Table 4: Top 10 Global Container Lines in 2016 and Their Market Share in 2018

The rank and share in 2016				The share in 2018	
Rank	Operator	TEU	Share	TEU	Share
1	Maersk	3.191.862	15.4%	4.074.066	18.3%
2	MSC	2.782.811	13.4%	3.288.634	14.3%
3	CMA CGM	2.307.799	11.1%	2.608.702	11.7%
4	Cosco	1.563.979	7.5%	2.036.206	9.1%
5	Evergreen	956.030	4.6%	1.109.716	5.0%
6	Hapag Lloyd	920.424	4.4%	1.600.160	7.2%
7	Hanjin Shipping	611.682	2.9%	BANKRUPT	
8	Hamburg Süd	610.554	2.9%	Acquired by Maersk	
9	OOCL	578.703	2.8%	688.977	3.1%
10	Yang Ming	570.440	2.7%	631.614	2.8%

Source: Alphaliner, 2016 and 2018

Table 4 illustrates that the top 4 operators represents 47.4% of total capacity in 2016 and 53.4% in 2018. The top 20 lines, on the other hand, represents 84.9% of

the total market in 2016. The market is likely to be even more concentrated as container lines will sign more mergers and acquisitions in future. Another aspect that we should consider is the global strategic alliances. Although strategic alliances do not intend to minimize the competition between alliance members, some basic attributes of services such as transit time and sailing frequency become identical as same vessels are shared. Interpreting the market concentration based on the strategic alliances in 2015, the concentration in the market is even more concentrated. We should clarify that not all capacities of the lines are deployed to strategic alliance agreements but since alliances usually cover the busiest trade routes, we can assume that important part of their total capacity are deployed in the alliances.

The demand of shipping is a derived-demand and it is considered to be inelastic (Lim, 1998). Franck and Bunel (1991) suggest that price-elasticity of shippers' demand is very low since usually manufactured products with high value are transported in liner shipping. However, they also acknowledged that shippers are still sensitive to any cost because of the global competition. Besides, not only manufactured goods but also significant number of low value cargoes is carried by containers. For instance, majority of containerized exports in Aegean region of Turkey are block marbles, which have low value per container.

Large part of the US exports in terms of TEU number belong to low value industries such as plastic scrap, wastepaper, and chemicals. These exporters enjoy the very low freight rates from the US to Far East thanks to trade imbalance. Let us consider plastic scrap market from North America to Far East. Container lines attract plastic scrap exporters by offering very low freight rates. These exporters have actually a quite price-sensitive demand for container shipping. Their customers are plastic recycling companies, and plastic recyclers can compete with virgin plastic granule suppliers only if they keep prices lower than virgin granules. If freight rates significantly increase from North America to Far East, total cost of plastic recyclers in Far East will also dramatically increase. This would lead to disappearance of plastic scrap trade in North America-Far East route. Thus, plastic scrap shippers' price-elasticity of demand for container shipping in that route is not as low as manufactured goods that Franck and Bunel (1991) mentioned. Nonetheless, this

price elasticity does not mean that a shipper will load much more containers if the price is lowered.

According to Davies (1986), entry to liner shipping market is relatively easier and sunk costs are relatively low. Davies claims that the market is contestable because liner shipping does not require inimitable technology and sunk costs are relatively low. Haralambides (2007), on the other hand, states that market has barriers to entry for new comers due to regular weekly services with expensive container vessels. Know-how about complex shipping business also creates another barrier for entry (Brooks, 2000). Besides, today container liner shipping business requires investment on EDI (Electronic data interchange) systems and inland transportation. The organization of new integrated business causes lines to invest more in EDI, trucking, terminal operations and inland warehouses. Therefore, sunk costs today are not as low as Davies stated back in 1986. The market also suffers idle capacity recently which causes high costs and low profitability.

Despite the high cost of market entry and exit for new comers and high market concentration, competition in container shipping is also keen. Today, the prices are not fixed and market is not allocated by lines like in conference times. Shippers are able to choose between different lines and can switch from one line to another easily. Shippers constantly evaluate the performance of container lines, not only based on the core shipping service, but also other service elements such as container tracking, relationship, and claim handling. Freight level is also a very significant determinant of competition between container lines. Effective management of customer relations is essential for the success of container lines. In sum, though concentration level increases in the market through mergers and acquisitions, high competition level based on price and service prevails in the market since shippers still can choose between different alternatives.

2.3. MARKETING IN CONTAINER SHIPPING

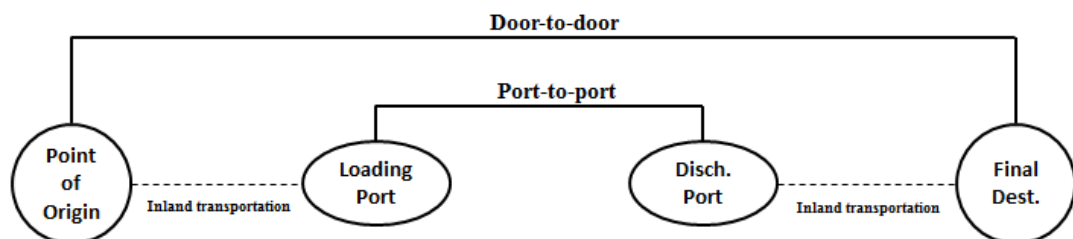
As mentioned previously, changes in regulations, scope of cooperation, and customer expectations transform container shipping to a more competitive market. Recent developments in globalized trade entail selecting carriers more carefully.

Shipping significantly affects the value of cargoes in several ways. Carrier selection of shippers is critical in a very competitive global market. More diverse customers in container shipping have occurred in terms of product characteristics, destination, price-sensitivity, time-sensitivity, and number of containers. Also number of small customers has also increased as the international trade procedure has turned into a simple process. Various customers in different segments have divergent selection and performance priorities (Maloni et al., 2016). Container lines need to understand preferences of customers in different segments and managing customer relations effectively by offering the best value. Hence, marketing in container shipping have become more important. This section attempt to reveal characteristics of container shipping service, customers, suppliers and intermediaries in container shipping, customer value in container shipping, and service quality and carrier selection.

2.3.1. Characteristics of Container Shipping Service

Container shipping is a complex professional B2B service that enables the movement of goods and delivery of other services. The core function of container shipping service, or the “product” in other words, is to move cargoes from loading port to destination port. Besides the core function, the goods are also transported from origin of cargo to final destination by a single firm. This one-stop-shopping in container shipping is defined as door-to-door transportation. Door-to-door service includes inland transportation of cargoes, or storage if necessary, from origin to loading port, then from loading port to discharge port, and finally from discharging port to final destination.

Figure 5: Container Shipping Service



Source: Derived from various resources

The suppliers of the service are container lines, the buyers of the service are shippers and the intermediaries between lines and shippers are freight forwarders (in some cases forwarders become the buyers of service). The supplier of the service can also be non-vessel operating common carriers (NVOCC) who charter a space from the vessels of container lines and market the space directly to customers. Shipper in a carriage contract (bill of lading) can be either seller or buyer of the cargo depending on the sales agreement – which specifies INCOTERMS such as FOB or CFR - between the seller and buyer. Freight forwarders may take role in two different ways. First, they can act as a rudimentary form of third party logistics provider (3PL) and arrange door-to-door transport organization of shippers. They implement the selection of trucking, railway and water transportation based on the instructions of shippers. Second, they may act like a travel agency and only presents the options gathered from container lines. Shipper makes the decision by evaluating the alternatives based on transit time, freight rate, demurrage free time period, sailing date and etc.

Three main types of customer exist in container shipping: large volume shippers, forwarders and small volume shippers (Brooks, 2000). Usually large volume shippers directly work with container lines while smaller volume shippers work through freight forwarders. Regardless shippers work through forwarders or not, the lines should always concern the needs and wants of final customers, shippers, and pay utmost attention in claims handling and performance of the service. After all, a shipper evaluates the performance and makes the final decision of container line selection or, the shipper may give up working with that container line in such a competitive market. Container lines should also ensure that forwarders receive high quality of service as well as advantageous offerings. Since forwarders combine less-than-container (LCL) and full container shipment of many different shippers, they become a single large customer. Forwarders either choose the container line on behalf of shipper or may influence the decision of shipper when shipper makes the decision.

Classification of services and defining the characteristics of a service is important for the success of marketing. Lovelock and Wright (2001) listed several

criteria to classify services. We evaluated the container shipping based on their classification criteria and created the below Table 5.

Table 5: Evaluation of Container Shipping Based on Services Classification

Classification criterion	Container Shipping
<i>Degree of tangibility</i>	The service is tangible that moves the cargoes, changes the possession and causes other physical outcomes (damage etc.)
<i>Recipient of the service</i>	The service is not directed at shippers themselves but their cargoes
<i>Place and time of service delivery</i>	The interaction for service delivery is usually conducted through physical channels (mail, phone). Customer visits for selling and relationship building also occur.
<i>Customized or standardized</i>	The core service is standardized for a specific route but supportive service elements can be customized (Performance reports for large customers, discounts, longer demurrage free time etc.) Different types of standardized containers also exist.
<i>Relationship degree</i>	The relationship degree is high like in other B2B services
<i>Extent of supply and demand balance</i>	The demand is very fluctuating in the long term. Capacity adjustment is a critical issue.
<i>Extent to which facilities, equipment, and people are part of the service experienced</i>	All physical elements, facilities and human element are critical. Customer may frequently evaluate (and highly affected by) the condition of containers, appearance and function of container tracking system and EDI, and capabilities and attitude of people.

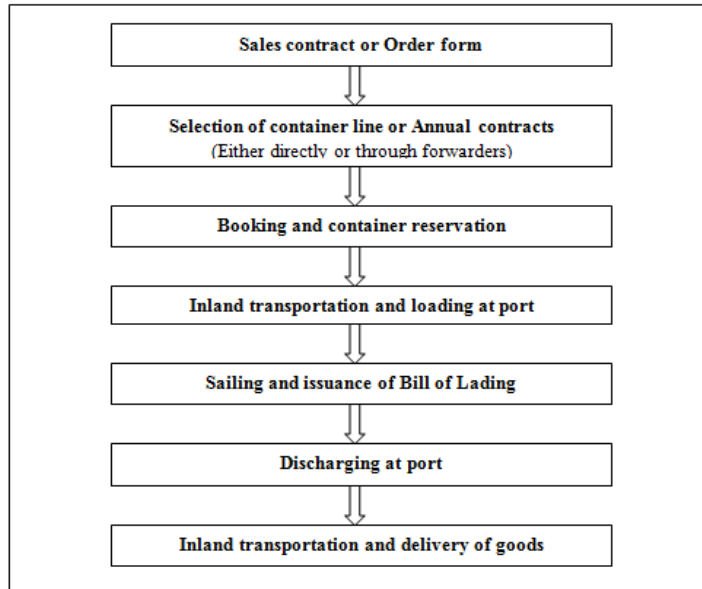
Source: Drawn by authors based on service classification of Lovelock and Wright (2001).

Containerization led to a standardized service, but container lines developed different type of standardized containers for different commodities: Reefer containers for refrigerated cargoes, open top for unshaped cargoes, tank containers for liquid cargoes. Moreover, dry containers, the most commonly used one, also have several types such as 20Foot, 40Foot, 40Foot High Cube and 45Foot. Customers of the service interact frequently with the people in suppliers company and, therefore, evaluate not only the performance of core service but also the way how the service is delivered (Durvasula et al., 2002).

Besides the classification above, container shipping service is also a complex one considering procedures prior, during, and after operation and its importance for customers as it affects the value of their cargoes. A simple procedure of an example of shipment transaction with shipper perspective can be seen as below. We should

note that this figure does not include custom clearance, port operations, other export and import documents, claims handling and performance evaluation.

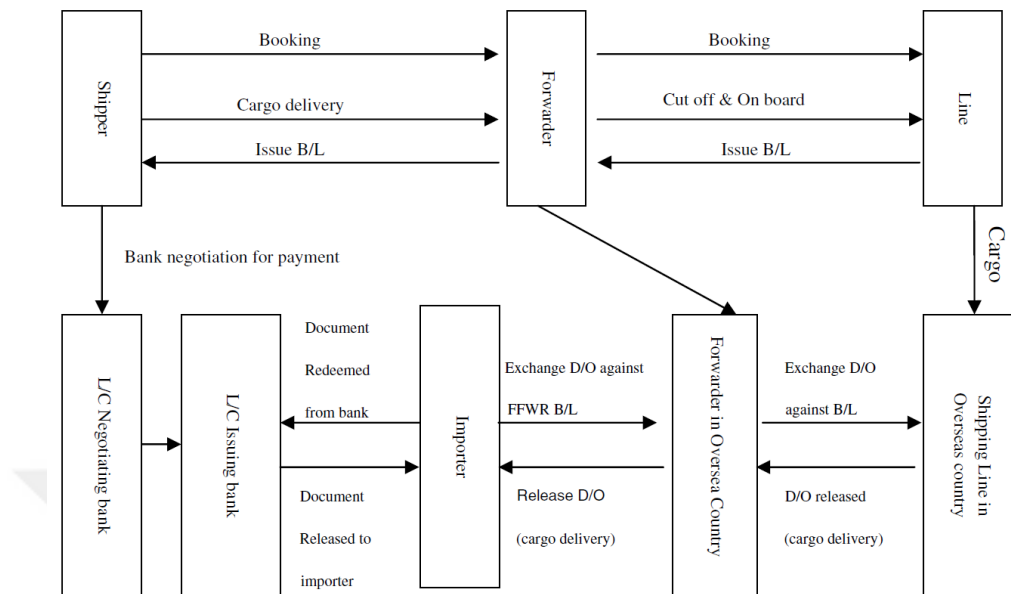
Figure 6: Process of Container Shipping With Shipper Perspective



Source: Derived from various resources

As shown in Figure 6, booking is submitted to container line through a forwarder or directly and suitable containers are reserved. Then goods are loaded into containers at factory and transported to port or goods are sent to port and loaded into containers at port. After the loading of containers to vessel is completed vessel sails and Bill of lading is issued by container lines or their agents. Bill of lading is not only used as a receipt of cargo but also document of title that is used in payment between buyer and seller. Most payments are carried out against original Bill of Lading or copy of Bill of Lading as well as other trading documents. After the B/L is delivered to shippers, shippers send Bill of Lading to consignee together with other trading documents. The consignee submits the B/L to container line at discharging port to receive containers. A broader picture that shows the whole export/import procedure by including major parties is illustrated in Figure 7.

Figure 7: Export/Import Procedure and Position of Container Shipping



Source: Chen et al. (2009)

During the procedure above, customers of container lines are in constant communication with them. The communication does not only include the information exchange between the line and shipper regarding basic procedure for producing and delivering the service. Shippers also need to get advisory information regarding transportation and custom procedures of their product type at destination country. The complexity of service and personalized requirements of shippers with different characteristics necessitates customized services. The core service might be standardized but the need and wants of customers are certainly not standard. The value perception of customer differs greatly. Hence, container lines should provide maximum value customized to requirements of different shippers by considering service quality and customer selection criteria issues. Following sections will touch upon customer value and selection criteria.

2.3.2. Customer Value in Container Shipping

It is of critical importance for companies to know what their customers value for. Since container shipping is a B2B service, it is vital to have a basic understanding of what customer value means for business services. Then, the value concept should be explained within the domain of container shipping services.

2.3.2.1. Customer Value in B2B services

Firms need to understand, create, and deliver value for their customers to gain a sustainable competitive advantage (Woodruff, 1997). Value creation helps firms in B2B markets to grow and achieve competitive advantage (Berghman et al., 2006). Understanding customer value is also critical to provide customer satisfaction which helps to receive loyalty of customers, positive word of mouth and higher market share (Ulaga and Chacour, 2001). Customer value has a positive effect on customer satisfaction which also has a positive effect on customer loyalty (Hu et al., 2009; Lam et al., 2004). Creating and delivering customer value also positively affects the customer relationship management (Wang et al., 2004).

Value concept is used in many different areas such as economics, finance, ethics, accounting, strategy, justice and marketing (Khalifa, 2004; Ulaga and Chacour 2001). Woodruff (1997) defines customer value as *“customer’s perceived preference for and evaluation of those product attributes, attribute performances, and consequences arising from use that facilitate (or block) achieving the customer’s goals and purposes in use situations”*. Value is a core concept in marketing. Marketing definition of American Marketing Association represent how marketing and value concepts are quite embedded: *“Marketing is the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large”*. In business-to-business (B2B) marketing domain, Anderson et al. (1993) defines customer value as *“perceived worth in monetary units of set of economics, technical, service, and social benefits received by a customer firm in exchange for the price paid for a product offering, taking into consideration the available suppliers’ offering and prices”*.

Definitions of value usually mention a trade-off between the benefits buyers receive and sacrifices buyers make.

Creating and delivering value to customers requires a long term commitment by companies. Constant and dynamic learning of what customers value for is a prerequisite for value creation (Parasuraman, 1997). Dynamic learning of customer needs and wants is crucial since they can change over time. In B2B markets, learning only the customer may not be sufficient. Learning the needs and wants of customers' customers is also the key for a successful value creation. In fact, Levitt (1960) expressed the importance of learning the real needs and wants of customer in marketing. Recently, some authors argue that value is not created at firm side, but instead, co-created together with customers (Prahalad and Ramaswamy, 2004; Vargo et al., 2008). However, Grönroos (2011) states that value co-creation concept can be misleading and he further explains that value of a service is created during the usage of the service. Co-creation of value can be accomplished only under certain circumstances.

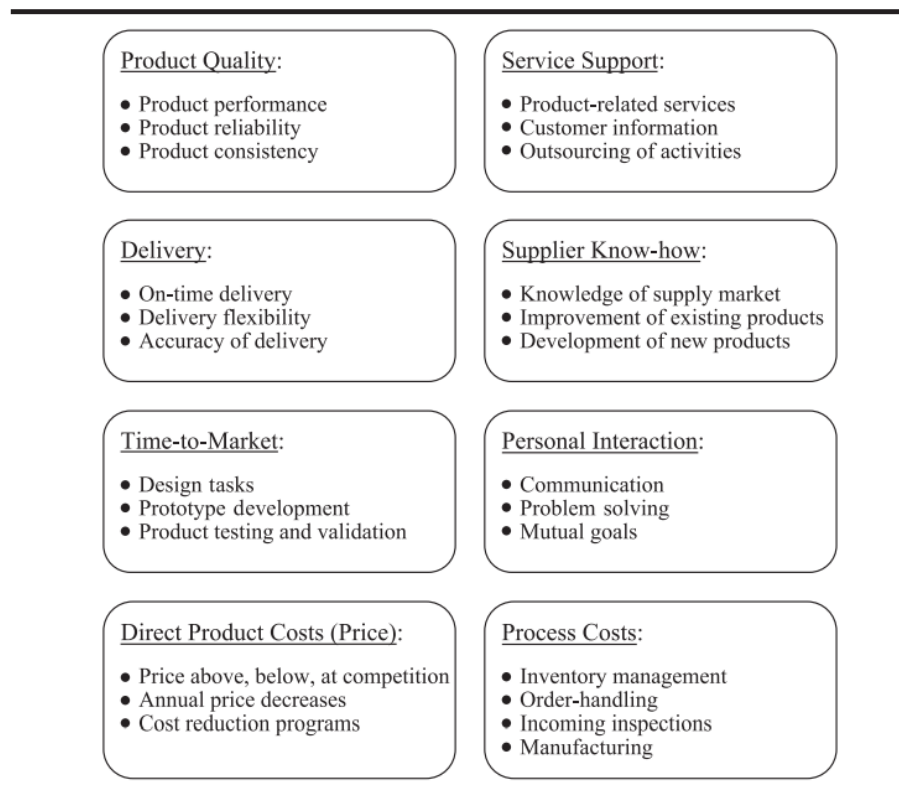
Porter (1985) indicates that a firm can create value for buyer in two ways: reducing the cost of buyer or increasing buyer performance. A product or a service has significant direct and indirect influence on the value chain of a buyer. The cost of buyer does not only refer the price of a product or service, but other costs such as searching time, transaction cost, labor force, and risk. A product or service can deliver a superior value if it also provides substantial advantages to the business process of buyer. The advantage may be regarding cost, time efficiency, reliability or any item that can contribute to the competitiveness of buyer. The advantage that supplier offers should be differentiated in the perception of customer to enable supplier's value superior than others (Porter, 1985).

A high value creation by a supplier does not necessarily reflect a high value perception on customers. Value of a product is decided by the perception of buyer, not the production of seller (Woodruff, 1997). Although two companies offer products with a similar value, a customer may consider value of a company's product higher than another company's due to her/his perception. In fact, "total offering" is more appropriate rather than the core product or service itself. Customers evaluate the value of an offering from a supplier by considering several other advantages such

as after sales services, financial concessions, on time delivery, and etc. In other words, customers consider the augmented product rather than only the core product (Lindgreen and Wynstra, 2005).

Value concept in B2B marketing context is usually investigated together with relational approach. Ulaga (2003) implemented a qualitative study and proposed eight dimensions as relationship value drivers. Ulaga suggested that product quality, service support, delivery, supplier know-how, time-to-market, personal interaction, direct product costs (price), and process costs are significant value drivers in B2B marketing. The sub-elements of the main eight dimensions are illustrated in below figure.

Figure 8: Relationship Value Drivers



Source: Ulaga (2003)

Walter et al. (2001) empirically tested 247 supplier companies and found the direct and indirect functions of relationship built between supplier and customer positively affect also the value perceived by suppliers. Eggert et al. (2006) conducted

a longitudinal analysis with manufacturers and found that relationship life cycle has a moderating role in value creation.

Perceived value of customers is specifically important in B2B services since no tangible product exists to evaluate the core benefit easily. Other benefits of total offering have a significant influence on the perceived value of customers. Hansen et al. (2008) studied customer perceived value (CPV) in B2B services context by applying a test on business customers of a telephone service company. They found that corporate reputation, information sharing, distributive fairness, and flexibility are significant drivers of CPV. In this study, corporate reputation was found to have a stronger influence on CPV. The authors state that corporate reputation decreases the monitoring cost since it reduces perceived risk related to the ambiguity in performance and asymmetry in information. This study proves the importance of affecting perception of customers towards the company and its services in B2B context.

Ravald and Grönroos (1996) also suggested that, instead of struggling with increasing core benefit, firms should increase perceived value by reducing the perceived sacrifice after thorough understanding of the value chain of customer. Grönroos (1997) stated that benefits of a value offering consist of core solution and additional solutions. He formulated customer perceived value as in below equation. Grönroos suggested that, to increase perceived value of customers in a relation context, firms should focus on personnel, technologies, knowledge and information, customer's time and customer itself.

$$\text{Customer perceived value} = \frac{\text{Core solution} + \text{Additional solutions}}{\text{Price} + \text{Relational costs}}$$

Similarly, Vandenbosch and Dawar (2002) addressed that firms can easily imitate a core product in such a global market where production factors are accessible to competitors. They suggest that firms should focus on more interaction with customers to capture value through reducing the interaction risk and cost. To accomplish this, customer experience and reach should be leveraged, more “touch points” should be established and the benefits of firm offering should be well explained to customers. Lapierre (2000) studied customer-perceived value in industrial service (different sections of information technology area) context.

Lapierre identified thirteen value drivers under three main aspect: product, service and relationship. Flexibility and responsiveness, which are service related value drivers, were found to be the most important value drivers among the thirteen drivers. Eggert et al. (2006) revealed that service support and personal interaction are the main drivers of value while core offering (product quality and delivery performance) has the lowest impact on value creation. Time-to-market and supplier know-how has a moderating influence on value perception of buyers. Eggert et al. also stated that service support and personal interaction are especially important in the relationship building phase in the eye of buyers.

In summary, value creation in B2B services brings numerous advantages to firms. Several authors suggest that B2B service providers should focus on additional services and customer interaction to increase perceived value of buyers rather than focusing on the core benefit. The first reason beyond this is because core benefit can easily be imitated by competitors. Second, it is more difficult to evaluate core benefits of services due to their intangible characteristics. Word of mouth, company image, communication, service support, and relationship building are all positive influencers on perceived value of customers. However, core benefits should not be ignored since they are the prerequisite for value creation. A clear superior core benefit can increase the value perception easily. Thus, a total offering consisting of core benefits, additional benefits, personal interaction and supportive services should be created and delivered. Benefits of the total offering should be well explained by the suppliers through effective communication to reduce perceived risk as well. Next section will investigate the value in container shipping services.

2.3.2.2. Customer Value in Container Shipping

Understanding the real needs and wants of shippers in container shipping is the first step to create and deliver value. We should first understand how much container shipping is actually important for shippers. How does container shipping affect the value chain of shippers? Since shipping is a derived demand, the right path is to investigate the original demand. The original demand arises from a buyer, thus, we need to investigate what a buyer needs and what criteria they attach importance

when selecting a supplier. By this way, we can reveal how much container shipping is actually critical for shippers.

Chéron and Kleinschmidt (1985) investigated nine supplier selection criteria papers between 1966 and 1979. According to their table, the most common supplier selection criteria are quality, price, delivery, production capacity, technical capacity and reputation. However, price, quality and delivery are the three most common criteria existing in all nine papers. Xia and Wu (2007) applied Analytic Hierarchical Process method for supplier selection and evaluated price, quality (technical level, defects, and reliability) and service (on-time delivery, supply capacity, repair turnaround time and warranty period). Verma and Pullman (1998) investigated selection criteria of manufacturers in the United States and considered quality, on-time delivery, cost, lead-time and flexibility. Hirakubo and Kublin (1998) studied supplier selection criteria of electronic manufacturers and considered price, quality, cost reduction capability, delivery, design, technical capability and manufacturing as selection criteria. Kannan and Tan (2002) found that ability to meet delivery due dates, commitment to quality, technical expertise, the price of materials, honest and frequent communications are the top five most important criteria that buyers evaluate when selecting a supplier.

In parallel to a literature review of Chéron and Kleinschmidt (1985), our literature review of supplier selection criteria also suggests that price, delivery, and quality are the three most common and important criteria that buyers consider when selecting a supplier. First of all, the importance of delivery indicates how shipping service is actually important for shippers. Container shipping, an important stage of logistics, significantly impacts the performance of the delivery. The performance of delivery is the key for firms to implement advanced logistics operations successfully. Delivery affects buyer's reliability and timeliness in production, inventory management and warehousing.

Container shipping also affect the other two (price and quality) important supplier selection criteria of buyers. First, the freight of shipping directly increases price of goods and commodities. Second, a poor performance of shipping, such as late delivery, may lead to indirect costs in production. A poor performance in container shipping may also lower the quality of goods because of any damage

during transportation. Some types of goods are more susceptible to damage such as fragile and refrigerated goods. Even if the goods are not damaged because of transportation, a late delivery may cause buyers to have negative perception on service quality of supplier. Hence, we can conclude that container shipping affects the perceived value of buyers towards the offering of suppliers.

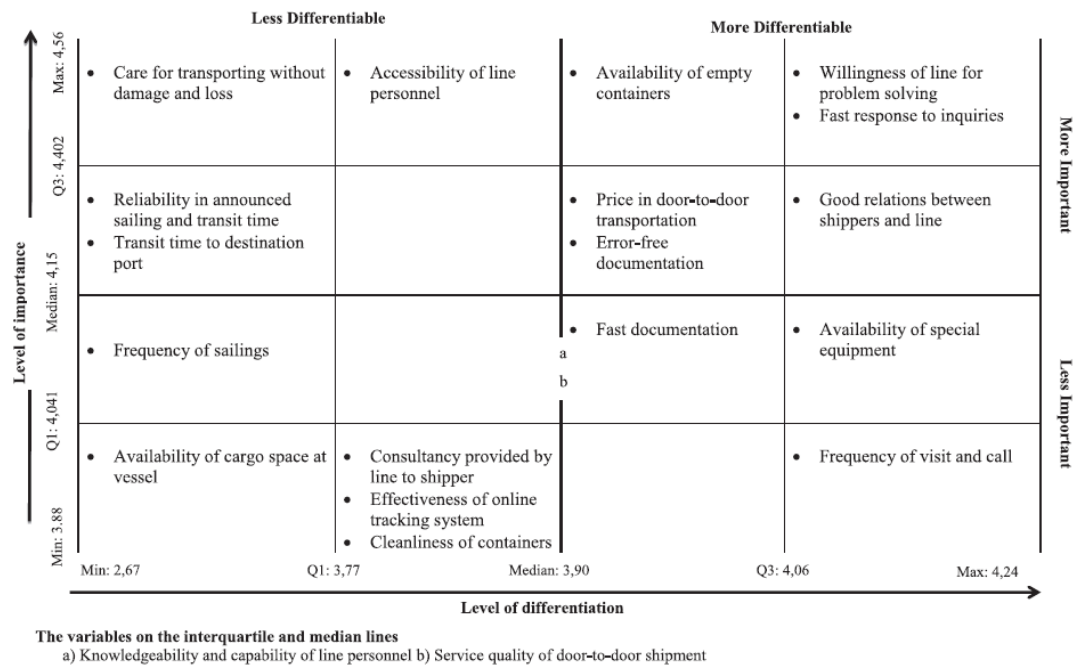
The success of container shipping to replace general cargo liners lies behind the superior value perceived by customers. Container shipping has provided faster, safer, more reliable and less costly transportation of cargoes. Containerization was an astonishing innovation that has changed the way of international trade. However, container shipping is now commoditized: the core service has become very similar or identical. According to Stopford (2009), differentiation in container shipping can be gained by vessel on time arrival, transit time door-to-door, carrier cost per move, cargo tracking, frequency of sailings, reliability of administration and space availability. Yap (2010) suggests that differentiation can be achieved through billing accuracy, responsiveness to customers' requirements, ensuring safety and security of cargo, schedule reliability, sailing time to the destination port, connectivity offered, and frequency of sailings. Durvasula et al. (1999) state that high quality of service can be an important differentiator to achieve competitive advantage in container shipping.

Some of the differentiation alternatives stated above are not effective differentiators anymore due to strategic agreements between container lines. Transit time, schedule reliability, frequency of sailings, and vessel on time arrival are almost identical between strategic partners as they share the same vessel to serve their customers. If we adopt the approach of Lapierre (2000), who proposed three main value drivers as product related, service related and relationship related, these attributes are all related to the product (or "core service" in other words). Thus, core service in container shipping has become even more commoditized due to strategic agreements such as alliances. Nonetheless, total offering concept should always be kept in mind to offer superior value to customers.

We conducted a study named "Differentiation of container shipping services in Turkey" which was published in Transport Policy journal. In that study, we asked container lines and freight forwarders how important a service attribute and how

differentiable that service attribute is. Total offering should include the most important core benefits, regardless if it is differentiable or not, and supportive services and relationship related matters. Thus, we created the Figure 9 to display differentiation level and importance level of all attributes. The measurement scale was 1 to 5.

Figure 9: Inter-quartile Display of Service Attributes



Source: Balci et al. (2018)

The cell on the right upper section displays the most important and most differentiable attributes. As it can be noticed, they are not related to core service. Transit time to destination, frequency of sailings, and care for transporting without damage and loss, reliability in announced sailing, availability of cargo space are all core service related but also the least differentiable attributes. We also applied exploratory factor analysis to classify the variables and read the results more easily.

Table 6: Mean Scores of Factors' Differentiation and Importance Levels

Factor	Differentiation statistics		Importance Statistics	
	Rank	Mean	Rank	Mean
Customer relation	1	4.01	1	4.17
Customer service	2	4.00	4	4.23
Door-to-door	3	3.95	2	4.22
Core service	4	3.42	3	4.21

Source: Balci et al. (2018)

The Table 6 demonstrates that customer service and relationship can be strong differentiators. Door-to-door services can also be strong differentiator. They can be utilized as strong value drivers when they are supported with the core service attributes. In the case where strategic partnership exists between the container lines, they are the main drivers for increasing perceived value of shippers. Container lines should also focus more on land-based transportation and aim for a smooth door-to-door service instead of offering only main waterborne service.

In a mature industry like containership, the key is to know how to increase the perceived value of shippers. Apparently, though the core benefits related with waterborne transportation is critical, they are not adequate to increase perceived value of shippers. Additional services and benefits should be accompanied to core benefits to offer superior value. To do this, container lines should first understand the needs and wants and selection criteria of shippers well. Container lines should explain the benefits of their offering in detail to minimize perceived risk of a potential shipper. For ongoing relationship with shippers, container lines should pay utmost attention for problem solving and respond inquiries on time. To accomplish minimizing perceived risk and increasing responsiveness, container lines should boost their accessibility and develop the communication between customers. An effective communication and personal interaction with customers can help container lines to increase perceived value of customers. The next section investigates literature about what criteria shippers consider when selecting a container line or evaluating service quality of a line's service.

2.3.3. Service Quality and Carrier Selection Variables in Container Shipping

Development in international trade and logistics rendered delivery of goods as vital as product itself for shippers. Sea transportation substantially influence total door-to-door transportation time and reliability of shippers' cargoes (Saldanha et al., 2009). Thus, shippers rigorously choose the container lines and evaluate their performance of them as container shipping significantly affects the value chain of shippers. The lines need to comprehend which attributes shippers consider when selecting their carriers or evaluate their satisfaction level with the existing carrier. In other words, service attributes help container lines to understand the needs and wants of shippers thoroughly for creating and delivering value for shippers.

Several authors investigated carrier selection criteria in container shipping. Some of these papers are directly related with container line selection while others search selection of third party logistics companies. Some studies use a general name, "carriers", without specifying whether road or water transportation. Our attention will be on studies related with container lines, but we also include the studies use the general term "carrier". Service quality and relationship building papers in container shipping also fall into interest of this dissertation since similar attributes are used in those studies.

One of the most cited carrier selection studies is the research of (Bardi et al. 1989), who surveyed shippers in the US in a new deregulated environment back in 1989. Among the total 18 variables, the top five most important determinants they found in order were: "transit time reliability of consistency", "door-to-door transportation rates or costs", "total door-to-door transit time", "willingness of carriers to negotiate rate change", and "financial stability of carrier". On the other hand the least differentiable determinants were: special equipment, quality of carrier salesmanship, claims processing, line-haul services, and scheduling flexibility. The variables of Bardi et al. (1989) were used by Murphy et al. (1997) and Kent and Parker (1999). In the study of Murphy et al. (1997), reliability, equipment availability, pick-up and delivery service, financial stability, and operating personnel were found by the US shippers to be the top 5 most important criteria. The

least important criteria were special equipment, carrier salesmanship, claims processing, line haul services, and shipment tracing. Murphy et al. (1997) found significant perception difference between carriers and shippers over some of the selection criteria.

Kent and Parker (1999) investigated the perception differences between import shippers, export shippers and international container carriers by using the same variables. Their study was particularly focused on the container lines though. Transit time reliability, equipment availability, frequency of service, willingness of carriers to negotiate rate changes, and quality of operating personnel were overall found to be the most important criteria. The authors found significant differences among the perception of carriers, import shippers and export shippers regarding the priority of criteria. Although same variables were asked to respondents in the same way and in the same country, the importance level of variables differ in the three studies except transit time reliability, which was found to be the most important factor in all studies.

Similarly, Brooks (1990) studied the ocean carrier selection criteria of eastern Canadian shippers both in 1982 and 1989. The top five most important variables in the study of 1982 were cost of services, frequency of sailings, carrier's reputation for reliability, transit time, and directness of sailings. The same 14 criteria were used in the survey study of 1989 and on-time pick-up and delivery performance entered into top five list while reliability variable was excluded from the top five list. The comparison between two studies suggests that shippers have become more sensitive to time issues in the seven year period.

In another study, Brooks (1995) surveyed freight forwarders, shippers (large shippers, small shippers), and consignees in 7 different countries. Brooks asked total 15 variables in the survey and found significant differences between the groups in different countries.

Murphy and Daley (1997) studied the selection criteria of shippers when selecting a freight forwarder. Among the 10 variables used in the survey, "expertise, reliability, information provided by company, attention, and reputation of forwarder" were the top five important criteria. In addition to displaying the mean scores of selection criteria, the authors also tested if sub-groups in the sample attach

significantly different importance scores on selection criteria. The results suggest that the importance scores vary depending on the size, usage frequency of forwarder services, and respondent's length of time at current position.

Menon et al. (1998) attempted to find out the criteria of logistics service user when selecting a third party logistics provider. The top five important variables, out of total nine variables used in the study, are as follows: "Responsiveness to problems, on time shipment and delivery, superior error rates, meeting and exceeding promises, and meeting performance requirements". Interestingly, the freight rate had the lowest importance score in the survey. The authors carried out correlation analysis between the criteria (as dependent variables) and competitive environment (as independent variables). The results indicated that hostility of environment significantly influences the relative importance on the criteria for respondents.

Pedersen and Gray (1998) studied the transport choice of exporters in Norway. Though the authors did not explicitly points out whether the carrier choice is a matter of sea or road, evidences – the statistics and the question in the study which asks if exporters work through forwarder or directly with carrier – support that it focuses on sea transportation. Pedersen and Gray suggested that the criteria of carrier selection are grouped under four main factors (in level of importance order): price related, time related, service related, and security related factors. Each dimension has four sub-variables. The authors asked respondents to rank the sub-variables i.e. asking the rank of low freight rate among other price related factors. Yet, the study failed to compare sub-variables under different factors. The results of the study indicated several interesting points. First, the smaller exporters tend to work through forwarders more than larger companies. Smaller companies also pay more importance to price related factor, though the difference is very little. Second, the exporters state that time becomes more important than price as value-to-weight ratio increases. Value of consignment also has positive correlation with preference of time against price, but the distinction is not as explicit as value-to-weight ratio.

Chin-Shan Lu, one of the leading researchers in liner shipping who conducts studies with shipper perspective, published two research papers in 2003 (Lu, 2003a; Lu, 2003b). He used the same 30 variables in both studies. In one of the papers, the author studied the carrier-shipper partnering relationship through structural equation

modeling. Among the seven service attribute components, the study concluded that timing related factor was the most significant predictor of satisfaction. This component includes “*availability of cargo space, accurate documentation, prompt response to claim, short transit time, high frequency of sailing, on-time pick-up, reliability of advertised sailing, and service coverage*”.

In the other paper, Lu (2003b) investigated the service attributes in terms of partnering relationship between maritime firms and shippers. Unlike the other study, this one contained the perspectives of shipping lines, shipping lines’ agents, and freight forwarders besides shippers. Lu asked the importance and satisfaction level of each 30 attributes. The study demonstrated that relative importance of service attributes differ between the shippers and shipping companies. According to shippers, the top 5 most important attributes are: “*accurate documentation, reliability of advertised sailing schedules, availability of cargo space, prompt response to shippers' complaints, and on-time pickup*”.

Thai (2008) performed a research in Vietnam to explore service quality dimensions of maritime transport. The research contained interviews and a survey respondents of which are different members of maritime transport such as forwarders, port operators, and logistics companies. Thai used 24 variables under 6 service quality dimensions in the survey and tested the scale reliability through Cronbach’s alpha test. Among the 24 variables in the study, the most important ones were: “*knowledge of customer needs and requirements, staff’s attitude and behavior towards changing customer requirements, knowledge and skills of management and operators, efficiency in operations and management, and quick response to request and inquiries*”.

Kannan et al. (2010) examined the ocean carrier selection criteria of shippers in India. They generated 48 variables that Indian shippers assess when selecting a container line. The results demonstrated that “*Low freight, price flexibility, flexibility, safety, equipment availability*” are the top five variables in their study. In another study the authors carried out in 2011, seven factors consisting of 45 variables were formulated based on focus groups performed with Indian shippers (Kannan et al., 2011). The authors constructed an AHP model with the seven factors. The importance weight scores of factors was observed as in order: “*Rate, scheduling,*

operations, infrastructure, customer service, IT orientation and communication, and reputation". Besides the latent factors, the most important top five observed variables are as same as the authors' previous study.

Maloni et al . (2016) analyzed the partnership between ocean carriers and shipper by means of developing a structured equation modeling (SEM). The authors conducted a survey on the US and Canadian shippers. The survey included total 20 variables to explore importance of selection criteria as well as relative performance of the carrier. They found that the top most important variables in the survey are: "*Willingness to negotiate rates, freight rates, customer service responsiveness, equipment availability, and employee competence*". The study revealed that two latent variables, namely rates and customer service, positively influence the overall relationship between carrier and shipper.

Wong et al. (2008) performed an exploratory factor analysis on 50 variables that they formulated as the criteria for mode and carrier selection in South China. The factors they obtained from the analysis are "*shipper's reputation, cargo location, shipper's own capabilities, customer service, cargo handling capabilities, relationship with Customs office, and comprehensive global service*". The authors carried out AHP analysis with different shipper groups which are created based on their cargo volume, cargo value, and cargo time sensitivity. The research demonstrated that the importance ranking of factors vary significantly between different shipper groups.

Banomyong and Supatn (2011) investigated selection of 3PL providers in the context of international freight shipments. They adopted the SERVQUAL approach to present service quality factors (Reliability, assurance, tangibility, empathy, responsiveness, and cost) used in logistics service. They conducted a logistic regression analysis to determine the factors influencing 3PL choice of shippers. Based on the results of the logistic regression, the authors found that reliability and assurance are the most significant factors affecting the 3PL choice of shippers.

Jang et al. (2013) studied the effects of logistics service quality (LSQ) on relationship between forwarders and container lines as well as loyalty of forwarders towards container lines. They divided the LSQ into two as operational LSQ and relational LSQ. Total 14 variables were generated to represent these two constructs.

Structural equation modeling was employed to test how these two LSQ constructs influence the loyalty and relationship quality. It was found that operational LSQ positively influences the commitment and satisfaction, but it does not have an effect on trust. By contrast, relational LSQ does not impact commitment, but positively influences satisfaction and trust. An interesting point of this paper is that it did not include the freight rate in the variables; instead, flexible pricing was preferred.

Setamanit and Pipatwattana (2015) investigated the ocean carrier selection of shippers in automotive industry located in Thailand. 24 variables were generated as selection criteria; which were categorized under five factors based on exploratory factor analysis. 14 variables were weighted four or above score in a five-point scale survey. The most important five variables were found as “*transit time reliability, document completed by carriers, quality of customer service, fast responds to problems, and issuing accurate invoice*”. One important point that the authors underlined was the fact that freight rate (cost) was ranked 11th among the 24 selection criteria. The authors claimed that the importance of selection criteria shifted from cost issues to service issues in recent years.

Tuna and Silan (2002) examined freight selection criteria of shippers who use Port of Izmir in Turkey. The authors carried out a survey study that includes 24 variables as selection criteria. Total response number in the survey was 37. The top five variables in the study were “*Delivering the cargo without damage, issuing accurate shipping documentation, delivering the cargo at the promised time, dependability in handling problems, and informing of changes to schedules*”. The least important variable in that study was “providing special equipment” with a mean score of 3.62 in a five-point scale questionnaire. The authors also applied exploratory factor analysis and came up with seven factors. Two of the factors are comprised of single variable; four of them are comprised of two variables; and one of the factors includes 14 variables.

A recent study on ocean carrier selection criteria was conducted by Fanam et al. (2016), who implemented a survey study with freight forwarders in Ghana. They included 39 variables as selection criteria, but number of variables was reduced to 16 based on the factor analysis. The authors generated six factors that explain the carrier selection criteria of freight forwarders: “*Service quality, environmental issues,*

schedule reliability, quick handling, freight rate, document accuracy". The importance ranking of variables was not mentioned in that paper, but it was stated that all the variables were weighted higher than three in a five-point scale questionnaire.

Chung et al. (2011) adopted 7Ps of services marketing mix to service attributes ocean carriers. They formulated 21 variables under the seven marketing mix factors and applied fuzzy Delphi method to determine the most important service attributes in the eye of freight forwarders. The study concluded that the top five most important attributes are: *"sales representative's expertise, transportation reliability, transportation fee, e-channel, and sales representative's manner"*. The respondents in the study were divided into two as time sensitive vs time insensitive. The results indicated a significant difference between the two groups in terms of importance ranking of service attributes.

Yuen and Thai (2015) examined the effect of service quality on customer satisfaction in liner shipping industry. A survey was generated to measure perceptions of shippers and forwarders on service quality dimensions of liner shipping. The survey included 19 criteria. The results determined four factors to represent service quality: Reliability, responsiveness, speed, and value. Based on the multiple regression analysis, the authors claimed that these four factors affect the overall customer satisfaction in liner shipping industry.

Conference system was able to apply price discrimination because they had market power. They charged up to 20 times more between two loads which have same tonnage and volume but different price sensitivity. In other words, they applied the price discrimination based on value of product. Today, thanks to containerization and recent developments in legal and market environment, liner shipping companies cannot apply different prices purely based on the commodity. Today, the core focus in global business perspective is the customer. Price discrimination should be based on the customer instead of purely the products they carry. For instance, Walmart is a giant supermarket company with many different product types. It is not likely that a liner applies different prices for different products unless it requires a specialized container.

CHAPTER THREE

ANALYSIS METHODOLOGIES AND APPROACHES IN MARKET SEGMENTATION

This chapter explains segmentation bases, approaches, and methodologies with a special focus on B2B markets, freight transportation, and passenger transportation. The first part of the chapter investigates the segmentation bases, approaches and methodologies in B2B market through a general overlook. It provides an explanation of segmentation bases and illustrated the classifications developed by different authors. Then, it describes the theoretical segmentation approaches and models, which are built by several authors in the literature. Finally, the first part ends by the explanation of the type of methodologies utilized in segmentation studies.

The second part of the chapter focuses on the studies in literature that have empirical segmentation application. The review investigates the bases and variables used in empirical researches. It also examines the methodology in terms of the methods used, sample, and scale etc. The review is limited with three application areas: General B2B markets, freight transportation market, and passenger transportation market. Passenger transportation is included because the literature claims that B2B segmentation studies lag behind consumer segmentation studies, and passenger transportation is the most similar consumer market to freight transportation. By this way, we are able to capture current methodological approaches used in consumer markets as well. Finally, the third part of the chapter discusses the advantages and disadvantages of segmentation methodologies and bases to be used in container shipping.

3.1 GENERAL OVERVIEW OF SEGMENTATION BASES, APPROACHES, AND METHODOLOGIES IN B2B MARKETS

This part focuses on segmentation bases, approaches, and methodologies with a general overlook, that is to say, it attempts to explain basic concepts and classifications of the three prominent issues in segmentation literature.

3.1.1. Classification of Segmentation Bases

Segmentation bases play a major role since the decision of which bases to be used has a significant importance for the success and effectiveness of market segmentation. As mentioned earlier in this dissertation, choice of segmentation bases depends on several issues. Goller et al. (2002) stated that the choice of bases depends on the type of industry whereas Mitchell and Wilson (1998) claims that it depends of the strategic goals of the company as well as the competition level in the market. On the other hand, Abratt (1993) indicated that the selection of bases is up to the convenience i.e. complexity and cost of bases and the aim of segmentation.

The classification of B2B segmentation bases shows some differences in the literature, though the authors refer quite similar bases, identical in most cases, in their studies. Weinstein (2004, pg:61-130), one of the prominent B2B segmentation authors, stated in his book that there are four kinds of segmentation bases: Geographic and firmographics; usage segmentation bases, benefit segmentation bases, and purchasing behavior and organizational psychographics.

According to Weinstein (2004), the geographic concern, when segmenting a market, is to decide whether going on global or local and to understand if regional factors impact a company's market. This actually reflects as "location of customers" in many studies. Firmographics, on the other hand, resembles the demographics in consumer markets. It includes the demographics of customers such as age of the firm, size of the firm in terms of sales or number of employees, and the industry that the firm is involved. The usage segmentation is used for revealing "why" and "how much" a customer buys the product of company. It includes bases such as competitive or loyal users, usage rate, and the end use purposes.

Benefit segmentation, which is first developed by Haley (1968) for consumer markets and which is considered to be much more effective than the previous two types of segmentation, deals with the value that customers receive or perceive from a product, service, or company. It concerns segmenting the customers based on their needs and wants rather than their demographics and usage rates. Weinstein (2004) defines the benefit segmentation as *"benefits are the sum of product advantages and satisfactions that meet a customer's needs and wants"*. Organizational

psychographics consider the psychological characteristics of buying firm's decision makers.

A different classification regarding segmentation bases is developed by Wedel and Kamakura (2000, p:7) They divided the bases, without separating B2C or B2B, into two as general and product specific as well as observable and unobservable as seen in below table.

Table 7: Classification of Segmentation Bases

	General	Product-specific
Observable	Cultural, geographic, and social economics variables	User status, usage frequency, store loyalty and patronage, situations
Unobservable	Psychographics, values, personality and life-style	Psychographics, benefits, perceptions, elasticities, attributes, preferences, intention

Source: Wedel and Kamakura (2000)

According to Wedel and Kamakura (2000), the general observable bases in industrial markets are the industry classification and location of company. Unobservable general bases are only used in consumer markets. Observable product-specific bases in industrial marketing are usage frequency, usage status, and loyalty. Unobservable product-specific are usually related to the benefit segmentation and they involve product attributes and preferences of customers when buying a product.

Another classification is developed by Kotler and Keller (2012; pg. 252), who adapted the classification from Shapiro and Bonoma (1984). Kotler and Keller (2012) indicated total 5 groups of segmentation bases for B2B markets. These groups are demographics, operating variables, purchasing approaches, situational factors, and personal characteristics. Demographics class includes industry, company size, and location. Operating variables involve technology, user or nonuser status, and customer capabilities. Purchasing approaches indicate the characteristics of purchasing organization and its purchasing behavior. It contains total 5 bases as purchasing function organization, power structure, nature of existing relationship, general purchasing policies, and purchasing criteria. Situational factors define the

characteristics of orders with three items: its urgency, its specific application, and its size. Personal characteristics are comprised of buyer and seller similarity, attitude of buyer towards risk, and loyalty of buyer to the selling companies.

Chéron and Kleinschmidt (1985) categorized industrial segmentation bases into four as illustrated in the Table 8 and the bases are purchasing organization characteristics, buying center characteristics, product characteristics, and vendor organization characteristics. Wind and Thomas (1994) divided the segmentation bases into four as well. The bases are environmental, organizational, buying center, and individual. These four bases include total 27 variables to be used in B2B markets, which are illustrated in Table 8.

Table 8: Industrial Segmentation Variables

Industrial segmentation variables
<i>Purchasing organization characteristics:</i>
Size, industry type, geographic location, organizational structure Purchasing volume and frequency, usage type, loyalty, single source – multi source purchasing policy, purchase situation (new or modify)
<i>Buying center characteristics:</i>
Age, education, sex, professional affiliation, personality, life style, attitudes, perceived risk, perceptions, preferences, relative importance of the determinants of the purchase decision, Structure of buying center, roles, influences, participation and involvement of members
<i>Product characteristics:</i>
Product categories (tangibles or intangibles, standardized or custom designed, capital goods or consumables), product life cycle position, product associations with problems of procedure, performance, and policy.
<i>Vendor organization characteristics:</i>
Relative importance of purchasing decision criteria, Past performance, preferences and risk aversion

Source: Cheron and Kleinschmidt (1985)

Schuster and Bodkin (1987), on the other hand, divided the segmentation bases into two basic categories: Macro and micro variables. Macro variables are readily available ones, usually simple to apply for segmentation, i.e. industry and size of the company, and many of them usually do not require a further examination such as questionnaires or interviews to have deeper insights of customers. Micro

variables, as its name is explicit, are used to have micro information regarding customers such as level of importance they attach to a product or service attributes. The below table, created by Schuster and Bodkin (1987), illustrates the classification of segmentation variables that are based on the US exporting companies data.

Table 9: Macro and Micro Segmentation Variables in Industrial Markets

Macro Variables	Micro Variables
• Size of the company • Geographical • Usage rate • Buying strategy • SIC code • Financial information • End market • Buying situation • Decision-making stage	• Criteria • Conflict • Buying units • Importance • Attitude • Organizational innovativeness • Personal characteristics • Others

Source: Schuster and Bodkin (1987)

Although the classification of bases shows diversity, the variables mentioned by authors demonstrate similar variables. As Wedel and Kamakura (2000) suggests, some of the bases are observable without conducting an extra research while some bases need extra research to segment the market. Some bases are related with the customer's organization itself, regardless of the product or service, while some of the bases are product specific. Rather than recognizing classification of segmentation bases, the important point at this issue is to understand both advantages and disadvantages of these bases, and to perceive the most appropriate segmentation bases, depending on segmentation purpose, the market involved in, and characteristics of segmenting company.

Which segmentation bases to use and which of them are superior to others has been an important focus of segmentation studies. Authors have various opinions on this subject. For example, Doyle and Saunders (1985) claimed that, rather than socioeconomic and psychological characteristics of the buyer, industrial segmentation should be based on the features of products that buyer purchases. In parallel, Nakip (1999) emphasized that, rather than the other bases, product

characteristics should be used in international industrial markets for segmentation, as they provide a more detailed understanding of the market. Psychographics are believed to be useful, but within this perspective, which indicates the superiority of product characteristics over buyer personal characteristics, they are actually as not as attractive as the authors claim.

In their conceptual study, Mitchell and Wilson (1998) discussed the segmentation bases in terms of how much they reveal customer needs and how much they can be applied in practice. The authors claimed that Standard Industrial Classification (SIC), although many companies use it for segmentation as a default, does not find out the needs of customers. Yet, it provides some information about how big the market is. In parallel, size of the account purchase was thought to be ineffective to understand needs of customers. Mitchell and Wilson (1998) also claimed that size of the account, purchase structure, and type of purchase - such as straight re-buy, modified re-buy, and new-task – say very little about customer needs.

Similarly, Dibb and Simkin (2001) also stated that account size does not generate heterogenous market segments containing customers with distinct needs. However, they also claimed that purely needs-based segmentation, which does not consider the attractiveness of customers, may not be financially beneficial for the segmenting customers. Besides, accessibility of purely needs-based segments may not be quite possible in many cases. Thus, as Shapiro and Bonoma (1984) also suggest, bringing accessible bases with needs-based bases together is the key.

The bases used in B2C and B2B markets also indicate some significant differences. In fact the philosophy is similar but since B2C bases focus on individuals rather than firms, dissimilarities are inevitable.

3.1.2. Segmentation Approaches and Models

Since “approach” is a vague concept that might imply several meanings, the word of “approach” is used in different meanings in segmentation literature. For instance, the procedure of combining different methodologies can be named as a kind of approach. Cha et al. (1995) defined incorporating factor analysis and cluster analysis as an approach. On the other hand, preference of segmentation bases, i.e. macro or micro variables, can also be called as an approach. Outwater et al. (2003),

for instance, used the term “attitudinal market segmentation approach” for indicating choice of traveler attitudes as a segmentation base. Many authors consider selection of macro or micro variables as a segmentation approach. Another usage of “approach” for market segmentation explains, in general, how to conduct a segmentation analysis. It involves two-type of approaches for market segmentation: A-priori approach and post-hoc approach, which, to the knowledge of author, was first defined by Green (1977).

In fact, the choice of a-priori or post-hoc approach also covers the type of methodological approach and segmentation base choice approach. A-priori segmentation means that the segments are identified by the researcher or practitioner in advance. For instance, in industrial markets, the researcher may first divide the market based on relevant variables such as geographic location and industry. Then, s/he seeks to find out the differences between the segments in terms of, mostly, micro variables such as the benefits consumers look for or usage purpose. In consumer markets, the researcher first segments the market, say it based on purchase rate of customers, e.g. heavy, medium, and light users, and then tries to figure out demographics of each pre-determined segments Wind (1978). In this type of segmentation, each customer is appointed to a segment by the researcher.

In post-hoc approach, segments are explored in reference to some statistical analyses that group customers with similar attitude or expectations. The researcher explores the segments based on micro variables, e.g. purchase criteria or satisfaction level with of customers. The segments emerge based on the customers’ behavior or choice towards some variables (in most cases micro variables). Customers with similar responses to segmentation bases pile up within the same segment. Afterwards, depending on the objective of segmentation, the researcher may use macro variables, e.g. demographics, to identify and profile the segments.

In fact, macro vs. micro and a-priori vs. post hoc approaches are intertwined due to the nature of micro and macro variables. As Wedel and Kamakura (2000) also suggests micro variables, e.g. criteria, importance and attitude, are usually unobservable. Thus, choice of micro variables as the base for segmentation does not allow implementing a-priori approach. The researcher should adopt a post-hoc approach if micro variables are used as the base for market segmentation. For

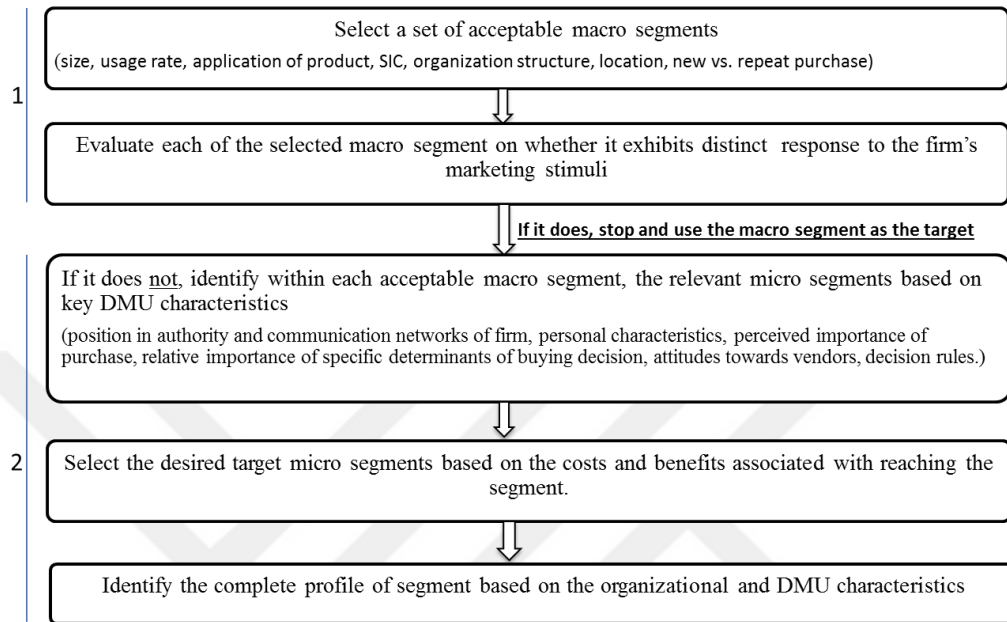
applying a-priori approach, observable variables, or macro variables in other terms, should be used for segmenting the market.

The literature indicates advantages and disadvantages of a-priori and post-hoc approaches. The discussion of pros and cons of each approach actually resemble to pros and cons of segmentation bases. The most fundamental trade-off between two approaches lies behind the accessibility requirement of a segmentation analysis. Ideally, many authors believe post-hoc approach is more advantageous because it adopts needs-based segmentation and, as a result, reveals more appropriate and realistic segments. However, in this case, it complicates the accessibility criterion of market segmentation Dibb and Wensley (2002). Yet, this problem can be overcome by linking readily available macro variables as descriptors to the needs-based segments derived from the analysis.

Some authors in the literature also propose segmentation models that can help to solve trade-off issue between the two approaches. Plank (1985) and Goller et al. (2002) suggested three types of segmentation model: Unordered/single segmentation, two-step segmentation, and multistep segmentation. In single segmentation model only one base is used for segmenting the market. In two-step models both macro and micro variables are used to segment the market. The multi-step model, on the other hand, is a kind of extended version of two-step model and includes three or more stages and bases to segment the market.

The most recognized model of two-step model belongs to Wind and Cardozo (1974). This model, first, suggests using the macro bases to segment the market and see if each segment has different reactions to marketing stimuli. If the researcher is satisfied with the diversity of segments in terms of their response to marketing stimuli, then the segmentation analysis can be stopped. If not satisfied, then the analysis can be conducted via including the micro variables, in other words, decision making unit characteristics (DMU). Upon evaluation of the segments considering the costs and benefits they bring, remaining segments should be profiled based on organizational and DMU characteristics.

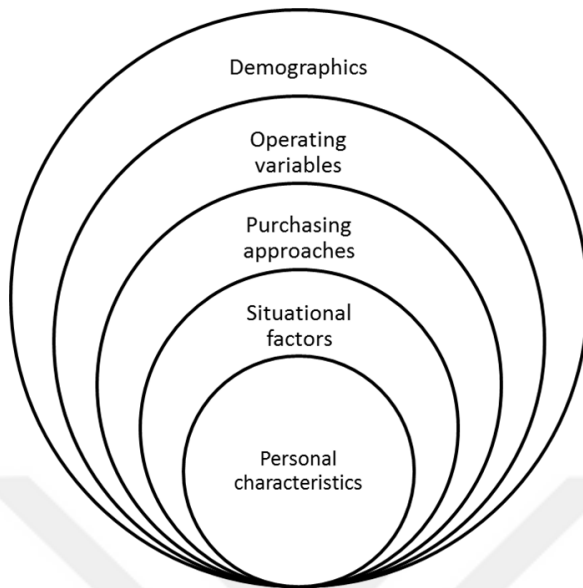
Figure 10: Summarized Version of Two-Stage Segmentation Model of Wind and



Source: Wind and Cardozo (1974)

Nested segmentation model of Shapiro and Bonoma (1984) is probably the most well-known multi-step segmentation model in the literature. The model consists of five layers, which are actually basic segmentation bases (demographics, operating variables, purchasing approach, situational factors, and personal characteristics). The researcher is supposed to start with outer nests and the move to inner nests. The researcher is free to choose any combination of bases depending on objectives and characteristics of the company. The outer the segmentation bases the more observable they are as seen in below Figure 11.

Figure 11: Nested Segmentation Model of Shapiro and Bonomo (1983)



Note: The original figure is rectangular

Table 10: Variables of Segmentation Bases in Nested Model

Organization Demographics		
Industry	Company size	Location
Operating Variables		
Technology	User-nonuser status	Customer capabilities
Purchasing approaches		
Organization of DMU	Purchasing policies	Purchasing criteria
Situational factors		
Urgency	Application	Size of order
Personal characteristics		
Motivation	Buyer-seller dyad	Risk perceptions

Source: Shapiro and Bonomo (1984)

In addition to above models, other scholars also applied two-step (Choffray and Lilien, 1980; Barclay & Ryan, 1997) and multi-step (Brown et al., 1989) segmentation model though not as popular as above models. The two type of segmentation models above (two-stage and multi-stage) are considered as normative

in the literature (Kalafatis and Cheston, 1997). Although these models can be appropriate up to certain level for different industries, they cannot be generalized. Thus, each industry should consider its own characteristics when evaluating the models developed by academics (Goller et. al., 1997).

Upon considering the approaches and models of segmentation, one important question remains before proceeding to the segmentation applications in literature: What are the methodological analyses for market segmentation?

3.1.3. Segmentation Analysis Methods

Since market segmentation has been studied for over 50 years, significant amount of methods exist for segmentation analysis. For the sake of better illustration, this paper explains the methods following the classification of Wedel and Kamakura (2000). They divided the methods as a-priori and post-hoc as well as descriptive and predictive. This dissertation covers all the methods under a-priori and post-hoc, which encompasses both descriptive and predictive methods as well. This part briefly explains the most common analysis methods used in market segmentation research. The analysis methods that this dissertation applies will be explained in detail in the fourth chapter.

3.1.3.1. A-priori segmentation Methods

According to classification of Wedel and Kamakura (2000), a-priori methods are cross-tabulation, log-linear models, regression, logistic regression, and discriminant analysis. All of the methods, except cross tabulation and log-linear models, are predictive, which explains the relationship between dependent and independent variables.

Another important point about these methods is that although they are classified under a-priori methods, they can also be utilized in post-hoc segmentation approaches. The reason why this study considers these methods as a-priori, probably Wedel and Kamakura (2010) do as well, because they are able to investigate the relationship between observable variables which are readily available. Yet, these methods are commonly used in studies that adopt post-hoc approach. For instance,

cross-tabulation is used to associate segments, which are created after a cluster analysis, and demographics such as firm size or location. Likewise, discriminant analysis is also used to predict clusters by micro variables such as selection criteria. Yet, this classification simplifies the presentation of the methods in the dissertation.

Cross-tabulation is a common statistical method in marketing research Burns and Bush (2006). It is one of the very basic methods for hypothesis testing. Cross-tabulation helps to search relationship between two or more nominal variables by evaluating the distribution of frequencies Malhotra and Birks (2007). It finds answers to questions such as if, for instance, usage rate of an accounting software is related to size of the company or if choice of purchase channel is related to location of customers. Chi-square analysis is accompanied to cross-tabulation to see if group differences are significant or not.

Regression analysis is a dependence technique that finds out the relationship between a dependent and independent variable. If the independent variable is single it is called as simple regression while if number of independent variables is two or more, then it is called as multiple regression analysis (Shukla, 2008). Both dependent and independent variables are metric. In case where the dependent variable is categorical, then the analysis is called as logistic regression, or logit as used by many (Hair et al., 2014). Logistic regression analysis is more appropriate in segmentation studies since dependent variable is categorical and it can predict membership of respondents. It is also mostly used in a-priori approach, yet the application of logistic regression does not prevail among segmentation studies.

Discriminant analysis is also a dependence technique and resembles to logistic regression in many ways i.e. they are both dependence technique and both of their dependent variable is categorical while independent variables are metric (Please refer to Hair et al. (2014) and Press and Wilson (1978) for more detailed comparison). When the dependent variable consists of, it is called as two-group discriminant analysis. When it consists of more than two categories then the analysis is called as multiple discriminant (Hair et al., 2014). In terms of segmentation research, discriminant analysis is of benefit to researchers in three ways: It helps to examine if segments significantly differ regarding independent (predictor) variables; it helps to find out the independent variables that predict majority of the group

differences; and it helps to assess accuracy of the segment groups (Malhotra and Birks, 2007).

Discriminant analysis is both utilized in a-priori and post-hoc studies. For instance, in an a-priori study, the customers can be divided into two as loyal and non-loyal customers, which will be the dependent variable. Then, the researcher may try to explore the most important predictors by considering the satisfaction level of customers on service attributes. In some post-hoc studies, the researcher reveals the segments mostly through cluster analysis and employs the segments as dependent variable in discriminant analysis.

3.1.3.2. Post-hoc Segmentation Methods

Cluster Analysis is probably the most common analysis methods in market segmentation studies (Sarstedt and Mooi, 2014). There are many reasons for classifying and as a result it has being applied in numerous other disciplines such as marketing, geography, biology, sociology, archaeology, bioinformatics, and astronomy (Everitt et al., 2011). Cluster analysis is a statistical interdependence technique that classifies objects based on their similarities on various issues. Cluster analysis is an exploratory and descriptive method that does not investigate an inferential relationship between variables (Kaufman and Rousseeuw, 2009).

Wedel and Kamakura (2000) classifies cluster analyses into three as non-overlapping, overlapping, and fuzzy. Non-overlapping cluster analysis is the most commonly used one in the literature. There are basically two-generic types of non-overlapping cluster analysis depending on the clustering algorithm: Hierarchical and non-hierarchical (Kaufman and Rousseeuw, 2009). The characteristics, advantages, and disadvantages of these two different kinds will be explained in detail in the fourth chapter.

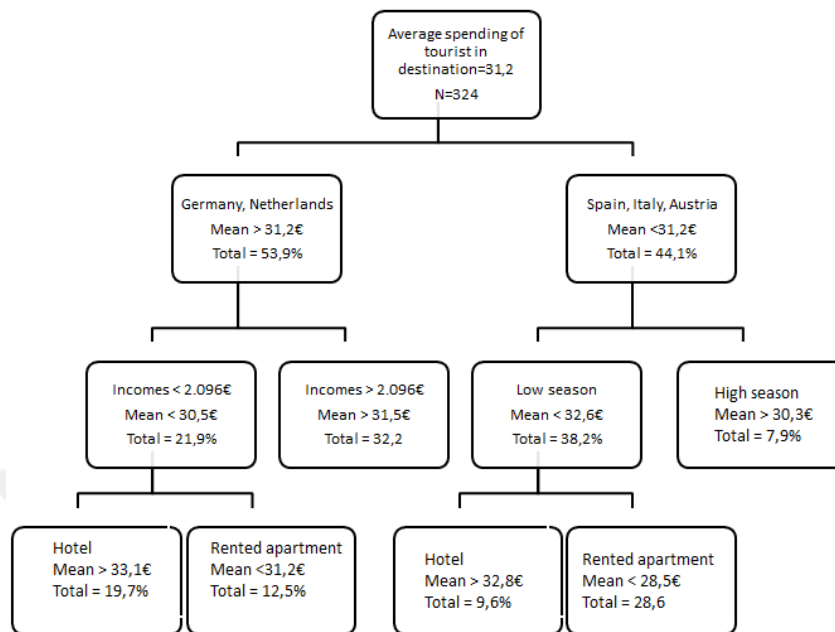
In market segmentation studies, clustering variables are usually selection criteria, satisfaction level, and preferences, which are metric or ordinal variables. Recently, SPSS statistical package has included two-stage clustering method that can simultaneously employ metric and nominal variables to group objects. Upon identifying the market segments through cluster analysis, researchers usually attempt

to profile and validate each segment by considering variables other than the clustering variables. For instance, a market can be segmented by using satisfaction level of customers as clustering variables. Then, the segments are profiled or validated by considering other variables such as the industry, price sensitivity, and usage rate of customers.

Another post-hoc segmentation method is Automatic Interaction Detection (AID), which is a predictive method. A researcher can measure the connection between nominal segmentation variables considering a dependent variable. It divides respondents into several categories that show significant difference in terms of a dependent variable based on independent variables (Wedel and Kamakura, 2000). When the dependent variable is categorical, then it is named as Chi-square Automatic Interaction Detection (CHAID). However, scale variables can also be used as the dependent variable in SPSS.

CHAID is a decision-tree technique and defined as *“An algorithm that divides a data set in exclusive and exhaustive segments that differ with respect to the response variable. The segments are defined by a tree structure of a number of independent variables, the predictors”* (van Diepen and Franses, 2006). CHAID analysis is common in consumer markets, especially among travel and tourism market segmentation studies. An example of CHAID output is displayed in Figure 12. Díaz-Pérez and Bethencourt-Cejas (2016) applies CHAID analysis based on the responses of tourists visiting La Palma Island. The dependent variable in the analysis is average expenditure of tourists.

Figure 12: Example of a CHAID Output



Source: Díaz-Pérez & Bethencourt-Cejas (2016)

Conjoint analysis is another method that researchers commonly use in segmentation studies. Conjoint analysis is an experimental method that measures trade-offs of customers towards product or brand attributes, and it is mostly used in consumer researches (Green and Srinivasan, 1990). Conjoint analysis is originally used for new product development, but also well adopted to market segmentation and pricing studies (Hair et al., 2014). Market segmentation is the third most common purpose of usage of conjoint analysis after new product development and pricing purposes (Cattin and Wittink, 1982).

In conjoint analysis, utility is a significant term which is the subjective evaluation of each customer for a product or service (Hair et al., 2014). There are several types of experiment design in conjoint analysis such as full profile, trade-off, paired comparison, and choice based (Wedel and Kamakura, 2000). To briefly explain, in conjoint analysis, the respondent is asked to evaluate, let's say, two different alternatives. These alternatives have several levels of product attributes. Imagine that the product is a smart phone. Then the attributes can be price, battery life, and screen size. Each of the attribute has different levels in each option for the

two alternative mobile phones. The experiment asks respondents which of the mobile phones s/he chooses in each time.

Artificial Neural Networks (ANN) is also a method that can produce clusters in market segmentation research. The use of ANN in market segmentation is not as common as previous methods but the applications are still witnessed especially in consumer market segmentation research (Bloom, 2005). The reason why ANN methodology is not very common in market segmentation may be difficulty of interpretation. Besides, several studies have also demonstrated that K-means cluster analysis performs better than ANN in many cases (Wedel and Kamakura, 2000).

3.2. EMPIRICAL SEGMENTATION STUDIES IN THE LITERATURE

This section covers the literature review of empirical academic segmentation papers. The literature review is divided into three parts. The first part investigates the papers in B2B markets; second one focuses on freight transportation; and the third one analyses passenger transportation studies. Since consumer segmentation research usually precedes B2B research, passenger transportation is also included in the review. The scope of consumer market segmentation literature is limited to passenger transport because literature in consumer market segmentation is immense and far beyond the purpose of this dissertation. As a result, passenger transportation is chosen since it is the most similar consumer market to freight transport, which is the main industry in this thesis.

Each part of this section (e.g. B2B or freight) analyzes the literature in terms of the aim of study for market segmentation, the approach that study adopts (i.e. post-hoc or a-priori), segmentation bases, segmentation descriptors, analysis methods, and the details of methodology such as how many segments is built, the number of respondents, the industry of application etc. Two main tables are created to summarize the literature: The first one reveals the items from aim of the research to segmentation descriptors, and the second one explains the details of methodology. The sections under each part are also organized in this way for the sake of reading simplicity.

3.2.1. Empirical Segmentation Studies in B2B

This part includes segmentation studies in B2B by excluding freight transportation and logistics since they are examined under a separate section following B2B studies. Majority (12 of them) of the studies are published in Industrial Marketing Management journal. Three of them are published in Journal of Marketing, while three of them are published in Journal of Business-to-Business Marketing. Journal of Academy of Marketing Science, Journal of Business and Industrial Marketing, and Journal of Services Marketing, Journal of Services Marketing, and Journal of Physical Distribution and Logistics Management have two articles in our review. Other journals also have one article such as International Marketing Review and Journal of Strategic Marketing. The articles are diverse in terms of whether they investigate product or service markets.

3.2.1.1. Segmentation Bases, Approaches, and Purposes in B2B Industries

This section investigates the empirical segmentation studies. The literature review is conducted by searching some specific keywords in Web of Science and Scopus. The key words are “B2B segment”, “industrial segment”, and “business segment”. In addition, some B2B and industrial marketing journals are searched by variations of “segment” keyword such as segmenting, segmentation etc. The journals are Industrial Marketing Management, Journal of Business and Industrial Marketing, and Journal of Business to Business Marketing. Besides, we also searched Dergipark, the Turkish database for scientific articles. Total 31 empirical articles were found out based on the above criteria as shown in Table 11.

Table 11: Approaches, Bases, Purposes, and Industries of B2B Segmentation Studies.

Author	A-priori / Post hoc	Purpose / benefit of segmentation	Bases	Industry
(Choffray and Lilien, 1980)	Post-hoc	To identify segments of organization homogeneous in the structure of their purchasing buyer behavior	the pattern of involvement (managers, engineers, purchasing officers) in the buying decision process	Cooling system
(Spekman, 1981)	A-priori	to classify organizations and developing differentiated communication	Organization type (commercial, non-profit, governmental)	N/A
(Chiesl and Lamb, 1983)	A-priori	Determining if buyer attitudes can be predicted by demographics	attitudes Japanese companies toward US market	Mix
(Vollering, 1984)	A-priori	customized communication	Response on marketing stimuli (effectiveness and efficiency of duration)	Computer
(Doyle and Saunders, 1985)	Post-hoc	To develop a positioning program for basic industrial	Product characteristics and company characteristics	Tactifiers (chemicals)
(Lynn, 1986)	A-priori	To analyze the structure of an industrial market for professional service	size, national or non-national, has audit committee or not.	Accounting
(Bennion, 1987)	Post-hoc	To select target markets and develop a plan to position the company	Benefits (product variables)	Steel forging
(Day et al., 1988)	Post-hoc	providing valuable insights into screening global marketing opportunities	Economic and social indicators	countries
(Thomas, 1989)	A-priori	To achieve more effective deployment of marketing resources and develop customized strategies for each segmentation	buying center purchase responsibilities	Scientific information
(Rangan et al., 1992)	Post-hoc	Identifying buying behaviour variations in macro-segments	buying behaviour	Steel
(Dowling et al., 1994)	Mix	Identifying potential early adopters of new technologies.	Organizational needs revealed by actual purchasing behaviour	Telecommunication
(A. Sharma and Lambert, 1994)	Post-hoc	Targeting the marketing mix for a specific group	Customer service	High Technology
(Gilmour et al., 1994)	A-priori	Delivering more effective customer service and using resources efficiently	Industry of customers / Customer service	Scientific laboratories

Table 11 (Continued)

Author	A-priori / Post hoc	Purpose / benefit of segmentation	Bases	Industry
(Fish et al., 1995)	Post-hoc	Exploring neural networks as a segmentation method	N/A	Not specified
(Verhallen et al., 1998)	A-priori	To prove if strategy-based segmentation is a more powerful and effective approach for industrial segmentation	Strategic orientation (customer, financial, internal process, human relations, R&D)	Car phones
(V-W Mitchell, 1998)	Post-hoc	To identify risk-based segments of professional service buyers	Risk perception of buyers	Non-profit (Planning consultancy)
(Nakip, 1999)	A-priori	Segmenting the world market according to usage rate of some products	Usage rate of countries (usage rate of 43 different selected products)	Countries
(Merrilees et al., 1999)	Post-hoc	To reveal different service level requirements of B2B service buyers	customer focus, size of provider, core service needs (there are 3 factors) and price sensitivity	Building maintenance services
(Millier, 2000)	A-priori	Discussing intuition as a segmentation method	N/A	non-existing new aluminum allow
(Mudambi, 2002)	Post-hoc	Exploring the importance of branding among B2B customer segments	Product, service, and branding attributes	Precision bearing
(Crittenden, Crittenden, & Muzyka, 2002)	Post-hoc	Increasing the profitability of a firm's market strategy	decision process and product attributes	Transit bus
(Albert, 2003)	A-priori	Developing specialized integrated communication strategies based on the need based segments	Needs of supply chain member	Commodity
(Bolton and Myers, 2003)	A-priori	Developing effective pricing strategies	price elasticity, average number of contracts per customers ,criticality of service support failure, average number of high-support contracts held	System service support
(Stan et al., 2007)	A-priori	Exploring the possible negative asymmetric effects in the impact of service quality on the satisfaction and retention	Account size, relationship period	Advertising

Table 11 (Continued)

Author	A- priori / Post hoc	Purpose / benefit of segmentation	Bases	Industry
(Shahrabi et al., 2009)	Post-hoc	To implement specific marketing solutions in accordance to the needs of the customers in target market.	Selection criteria of customers	Construction steel
Harrison(Harrison & Kjellberg, 2010)	Construtive	Allowing the firm to devise the most appropriate marketing program	Size, product usage, customer type, user interactions	Nonexisting / in the making biocencor
(Terho & Halinen, 2012)	Post-hoc (P)	To provide new insights on the nature of companies' customer portfolios in business markets	dimensions of customer portfolio	N/A
(Mark, Niraj, & Dawar, 2012)	Post-hoc (P)	To examine how these segments help to predict customer profitability within each segment	buying behaviour over time and profitability	Computer parts
(Jadczaková, 2013)	Post-hoc	Relating needs of business segments to marketing stimuli	psychographics	Mix
(Thomas, 2016)	Post-hoc (D)	Finding competitive advantage, more efficient use of resource, and better understand market opportunities	needs and wants	Education
(Akoğul and Tuna, 2016)	Post-hoc	To find out target markets and effective products	Purchase patterns	Bread factory

Considering the approach of B2B empirical articles, 17 of the articles adopt post-hoc approach while 14 of them adopt a-priori approach. It is interesting to note that the last five studies have adopted post-hoc approach. The industries of segmentation studies show great diversity. There are basic materials or semi-products such as steel, precision bearing etc. and there are technological products i.e. computers, car phones, scientific laboratories, and telecommunication products. A significant amount of services also exist in the literature. Some of the services are building maintenance services, advertising, and education. On the other hand, two

studies segment countries instead of an industry. Two of the studies do not specify the industry, and one study applies the analysis in mix industries.

The purposes of segmenting the market in the literature are diverse. Three of the studies apply the segmentation analysis for customized marketing communication (Albert, 2003; Spekman, 1981; Vollering, 1984). Efficient and effective use of marketing resources is also mentioned in the three of the research aims (Gilmour et al., 2013; Thomas, 1989; Thomas, 2016). Developing a positioning strategy is aimed by the two researches (Bennion, 1987; Doyle and Saunders, 1985). Several studies aim to understand the structure of an industry or identify the segments of a market (Akoğul and Tuna, 2016; Choffray and Lilien, 1980; Lynn, 1986; Merrilees, 1999; Mitchell, 1998). Delivering customized marketing offering and being more effective in customer service are also goals of segmentation analysis in B2B literature (Bolton and Myers, 2003; Gilmour et al. 2013; Shahrabi et al., 2009; Thomas, 1989). Increasing profitability of the segmenting firm is also touched upon in the literature (Crittenden et al., 2002; Mark et al., 2012). Identifying early adopters to a product, identifying buyer behavior, and understanding customers' needs better are also given as aims of the studies.

The segmentation bases used in the literature also show great variety. Some patterns of a relationship are witnessed between the approach and purpose of segmentation and the segmentation bases utilized in the analysis. In a-priori studies, as expected due to the nature of studies, the segmentation bases are usually demographics of companies. For instance, Stan et al. (2007) segmented the advertising market based on the account size and relationship period. Gilmour et al. (2013) utilized industry of customers as a segmentation base in scientific laboratory market. Spekman (1981) used organization type as the basis of segmentation analysis. Studies adopting post-hoc approach, on the other hand, use bases that need a further investigation of customers such as their buyer behavior, selection criteria, and service expectations. Rangan et al. (1992) used buying behavior when segmenting the steel market. Sharma and Lambert (2013) employ customer service expectations in the segmentation of high-tech market. Shahrabi et al. (2009) analyzed selection criteria as the base of segmentation in construction steel market. Thomas

(2016) utilized the needs and wants of customer in his post-hoc approach segmentation analysis that investigates the professional education services.

The pattern of relation between the purpose of segmentation and the bases used in the analysis is more obvious considering the literature studied. For instance, Mitchell (1998) bases the segmentation analysis on risk perception of potential users as the study aims to identify risk-based segments. Bolton and Myers (2003) utilize price elasticity of customers as the purpose of study is to develop effective pricing strategies. Mudambi (2002) used product, service, and branding attributes to explore importance of branding among different B2B buyers. Lynn (1986) utilized nominal segmentation bases such as size, national or not national, has audit or not to analyze structure of a market for accounting services. Selection criteria, benefits, and needs and wants of customers are utilized for various purposes. These variables are quite similar to each other but their names are stated differently in the literature. Benefits of customer can be the general name for these metric variables. Selecting a target market, developing customized communication strategies, implementing specific marketing solutions, and better understanding marketing opportunities are some of the purposes that benefits of customers are utilized as the segmentation base.

3.2.1.2 Analysis Methodologies Used in B2B Literature

When the previous literature in B2B segmentation is investigated, various analysis methods appear. The analysis methodologies are reviewed by evaluating which methods are used, number of segmenting variables, number of respondents, number of factors if exist, number of segments explored or determined a-priori in advance, and finally the scale of metric depending variable if applicable.

Table 12: Analysis Methodologies in B2B Literature

Author	Analysis methods	No of segmenting variables	No of respondent	No of factors	No of segments	scale
(Choffray and Lilien, 1980)	Cluster (Hierarchical)	1	118	N/A	4	N/A
(Spekman, 1981)	Factor and discriminant analysis	17	92	7	3	5
(Chiesl and Lamb, 1983)	MANOVA	24	123	6	N/A	5
(Vollering, 1984)	Factor analysis and table illustration	9	134	4	4	N/A
(Doyle and Saunders, 1985)	Exploratory factor, cluster analysis (K-means)	10	76 (products)	4	12	N/A
(Lynn, 1986)	Factor analysis, ANOVA, cross tabulation	38	321	13	3	7
(Bennion, 1987)	Factor and cluster analysis (Hierarchical)	24	44	5	5	5
(Day et al., 1988)	Factor and cluster analysis (FASTCLUS SAS)	16	96	3	6	N/A
(Thomas, 1989)	Discriminant	15	144	N/A	2	6
(Rangan et al., 1992)	cluster analysis	12	161	N/A	4	mix
(Dowling et al., 1994)	Cluster (K-means) and discriminant analysis, ANOVA Table	8	NA	N/A	12	
(A. Sharma and Lambert, 1994)	Factor analysis, cluster analysis, discriminant analysis	29	246	1	2	
(Gilmour et al., 1994)	ordinal ranking of service elements	9	40	N/A	6	
(Fish et al., 1995)	ANN	7	N/A	N/A	N/A	N/A
(Verhallen et al., 1998)	ANOVA	5	200	N/A	N/A	N/A
(V-W Mitchell, 1998)	EFA, CFA, Cluster (K-means), discriminant	17	185	3	3	7
(Nakip, 1999)	Cluster (K-means) and discriminant analysis	43		N/A	3	N/A
(Merrilees et al., 1999)	EFA, cluster analysis, ANOVA	13 (4)	109	3	4	
(Millier, 2000)	segmenting the market through intuition	N/A	N/A	N/A	N/A	N/A
(Mudambi, 2002)	Factor analysis, cluster analysis, ANOVA	not stated	115	8	3	7

Table 12 (Continued)

Author	Analysis methods	No of segmenting variables	No of respondent	No of factors	No of segments	scale
(Crittenden et al., 2002)	Cluster (for choosing variables) and Conjoint analysis	25 (15 /10)	103	N/A	12 (6 / 6)	N/A
(Albert, 2003)	Factor analysis, ANOVA	10	281	2	N/A	5
(Bolton and Myers, 2003)	econometric model, regression	1	N/A	N/A	7	N/A
(Stan et al., 2007)	EFA, CFA, Regression	16	124	4	4	7
(Shahrabi et al., 2009)	Cluster analysis (Hierarchical)	13	210	7	5	10
(Harrison and Kjellberg, 2010)	Case study (interviews)	N/A	36	N/A	N/A	N/A
(Terho and Halinen, 2012)	EFA, CFA, Cluster (Hierarchical and k-means), and discriminant	17 (7)	212	7	3	7
(Mark et al., 2012)	finite mixture regression model	2	N/A	N/A	6	N/A
(Jadczaková, 2013)	EFA, cluster analysis, kruskow wallis	19	278	7	5	5
(Thomas, 2016)	EFA, Cluster analysis (Hierarchical)	11	22 / 44	3 / 4	4 / 5	5
(Akoğul and Tuna, 2016)	Cluster analysis, multidimensional scale	1	N/A	N/A	3	N/A

As shown in Table 12, there are several methods for market segmentation in the literature. The most commonly applied method to segment market in post-hoc studies is cluster analysis. Factor analysis is another common method used in segmentation analysis. Factor analysis has two kinds of usage purposes depending on the approach of segmentation. In a-priori studies, factor analyses are used to reduce large number of variables into small number of latent variables, and then used as an independent variable in the study (Spekman, 1981). For instance, in the study of Stan et al. (2007), customers are divided into four based on their size and relationship period using a-priori approach. Then, the authors reduce 16 observed variables into 4 latent variables. Then, they test if importance levels given to these factors vary based on the segments. Similarly, Albert (2003) used factor scores as dependent variable in ANOVA analysis, by which several a-priori groups are compared to understand if significant differences exist.

The second usage purpose of factor analysis is to use factors as clustering variables. This is quite a well-established study applied by many authors. This “factor analysis first and then cluster analysis” methodology is also found to be a common practice as shown in the Table 12 (Bennion, 1987; Day et al., 1988; Jadcakova, 2013; Merrilees et al., 1999; Mudambi, 2002; Thomas; 2016). In this sequence of analysis, some authors embed discriminant analysis after conducting the cluster analysis (Mitchell, 1998; Sharma and Lambert, 2013; Terbo and Halinen, 2012). Some of the papers do not carry out a factor analysis, but instead perform the cluster analysis with the observed variables (Chofray and Lillien, 1980; Lynn, 1986; Rangan et al., 1992; Shahrabi, 2009). Among cluster analyses in the literature, some of them use hierarchical, some of them use K-means, and some use both as a clustering method.

As seen in the Table 12, a-priori studies do not use cluster analysis for segmenting the markets. For instance, Spekman (1981) determined 3 segments in advance based on the organization type of companies. Then, seven factors, created from 17 variables, are used as independent variables in discriminant analysis while the segments are used as dependent variable. Chiesl and Lamb (1983) used MANOVA analysis to determine if buyer attitudes can be predicted by organization characteristics. Lynn (1986) used factor analysis and check if the importance level given to the factors change between the firm characteristics (smaller/larger businesses etc.). Thomas (1989) divided the scientific information market into three as librarian, scientist, and manager. Then, he performed discriminant analysis to understand if a segment can be predicted based on the buyer center purchase responsibilities.

Besides cluster, discriminant, factor analysis, ANOVA, MANOVA, and cross tabulation, other methods also exist in the literature though not as common as the aforementioned ones. For instance, Analytical neural network (ANN) is used by Fish et al. (1995). The paper is not written for segmenting a specific market, but rather to prove ANN is superior to logistic regression in the segmentation analyses. Crittenden et al. (2002) accompanied conjoint analysis and cluster analysis. Bolton and Myers (2003) developed an econometric model and use regression analysis to predict the factors affecting price sensitivity of customers among 7 countries in three different

regions. Harrison and Kjellberg (2010) use a qualitative method and conduct telephone interviews for data collection. Mark et al. (2012) conduct finite mixture regression analysis to reveal profitability of customers based on returns and relationship period of customer in the past.

Considering the studies applying survey for data collection, the number of respondents is diverse. The highest number of sample in our literature review is 321 respondents while the lowest is 40. The average number of respondents is 154,6 in B2B segmentation studies in our review. Number of segments determined or explored are as high as 12 and as small as 2. The number of scale point of segmenting variables is very close to each other. Scale-points change between 5 and 10. Six of the studies use 5-point scale, one of them uses 6-point, five of them use 7-point scale, and one of them is 10-point scale.

3.2.2 Empirical Segmentation Studies in Freight Transport

The review of this part is conducted by searching some specific keywords in Web of Science and Scopus. The key words were combination of “segment”, “segmentation” and “shipper”, “shipping”, “freight”, “container”, “airfreight”, “freight transportation”. Besides, the keywords of “segment” and “segmentation” are searched in prominent shipping and transportation journals such as Maritime Policy and Management, Maritime Economics and Logistics, Asian Journal of Shipping and Logistics, International Journal of Shipping and Transport Logistics, Transportation Research Part E: Logistics and Transportation Review, Research in Transportation Business and Management etc.

This part investigates the empirical segmentation literature in freight transport. There are total 9 studies that the literature review includes. The first one was published in 1978 and the last one was published in 2015. The journals that publications take place are Transportation Journal, Transportation, European Journal of Marketing, Transportation Research Part E, Journal of Air Transport Management, Maritime Policy and Management, and the Service Industries Journal.

3.2.2.1 Segmentation bases, Approaches, and Purposes in Freight Transport

Since this part is more relevant to our research than previous part, profile or descriptor variables of segmentation are also included in the review to have deeper understanding. The limited number of research also allows us to discuss the studies in more detail, which is also necessary considering the relevance of subject to the thesis.

Table 13: Approaches, Purposes, and Bases in Freight Transport Literature

Author	A-priori / Post hoc	Objective / Purpose / benefit of segmentation	Bases	Descriptors / Profiling / Predicting variables	Mode
McGinnis, 1978	Post-hoc	To develop new products, differentiate existing products, and tailor marketing efforts	Attitudes of shippers	Product characteristics, shipment size, mode used, and SIC	Transport in general
Collison, 1984)	A-priori	To develop marketing and service programs that are tailored to the needs of particular groups of shippers	Service attributes	Cargo characteristics / customer characteristics	Sea
Matear and Gray, 1994	Post-hoc	To allow resources to be more specifically targeted to particular buyers of freight transport	Benefits of customers (choice criteria)	product characteristics, transport service characteristics, company demographics, control variables	Transport in general
Murphy and Daley, 1994	A-priori	Find out distinct needs of different type of customers	Carrier selection criteria	N/A	Logistics
Lu et al., 2005	Post-hoc	To evaluate website services in the liner shipping industry based on service requirements of firms	Service requirements	Turnover, trading company or manufacturer, main export cargo, user status	Sea
Arunotayanun and Polak, 2010	Post-hoc	Finding out homogenous groups of shippers according to their transport mode choice behavior	Cost, time, quality, flexibility	commodity types	Transport in general

Table 13 (Continued)

Author	A-priori / Post hoc	Objective / Purpose / benefit of segmentation	Bases	Descriptors / Profiling / Predicting variables	Mode
Tsai et al., 2011	A-priori	Helping effectively allocate a firm's resources to target markets	Satisfaction level of customers on strategic variables (pricing, service and channel)	Shipment destination, shipment size, frequency of shipment, time in transit, product status	Air
Chao et al., 2013	Post-hoc	Segregate large and diverse customer groups and allocate resources to achieve goal of meeting customer needs	service requirement of freight forwarders	NILL	Air
Wen and Lin, 2015	Post-hoc	Development of effective marketing and operating strategies for ocean carriers	service attributes (freight forwarders)	Age of company, no of employee, capital, investment of carrier, average TEU of	Sea

In terms of the approach that studies adopt, six of them deal with segmentation analysis using post-hoc approach while three of them use a-priori approach. The purposes of segmentation analysis claimed by the studies do not vary much in the freight transport literature. One of them is developing new products, services, or marketing program, and operating strategies for the customers. Finding homogenous and distinct groups of customers in a market is another purposes stated by the studies. Effective allocation of resources is also mentioned by three studies. The segmentation bases used in the freight literature are usually selection criteria, service attributes, attitudes of shippers, and satisfaction level of customers. Three of the studies apply segmentation in sea mode, two of them in air, three of them transport in general, and one applies the segmentation in logistics.

A more detailed analysis of each study, especially the ones with sea transport is needed. McGinnis (1978) – the first ever segmentation study in freight transport in our literature review – segmented the transport market (not sea specific) in the US based on attitudes of shippers. These attitudes are “speed and reliability”, loss and damage”, “inventories”, “freight rates”, “market competitiveness”, “company policy and customer influence”, and “external market influences. In fact, McGinnis did not only utilize needs and wants of shippers as bases, but also the shippers market

conditions of shippers such as competition level. McGinnis (1978) found total seven segments based on the 7 attitudinal factors. The names of the segment found in this study are “competitive shipper”, “price oriented shipper”, “service oriented shipper”, “large shipper”, “loss and damage oriented shipper”, “externally influenced shipper”, “inventory oriented shipper. These segments are described through several product characteristics such as value, weight, perishability, and traffic patterns such as shipment size and transport mode used.

Collison (1984) is the first study that conducts a segmentation analysis in sea mode in our literature review. Collison adopts a-priori approach and investigates market segmentation based on a specific route (Pacific Northwest – Central Alaska). Since the study adopts a-priori approaches, no segment are explored. Instead, it seeks to find out if shippers’ score on service attributes vary based on the readily available shipper characteristics such as perishable/nonperishable, high-rush/non-rush, consumer/industrial, large/small tonnage, and shipper/consolidator etc. The service attribute factors are timeliness of service, facilities and equipment, traffic service, pricing and rate, and marketing service. Collison (1984) find significant differences between different customers, especially between perishable/non-perishable, rush/non-rush, and hazardous/non-hazardous cargoes.

Matear and Gray (1994) segmented the Irish freight market via adopting a post-hoc approach. The study uses benefits of shippers, selection criteria in other terms, as a base to segment the market. The selection criteria factors are “carrier characteristics”, “route characteristics”, “time characteristics”, “price characteristics”, and “control”. The names of the segments are “route sensitive” “not price sensitive”, and “price sensitive”. Four general profiling variables were utilized in this segmentation research: product characteristics, transport service characteristics, company demographics, and control variables. The segments show differences in terms of several profiling variables such as number of employee, location of companies, the rate of shipments in a specific route, and product group. Yet, the study fails to report whether these differences are statistically significant or not.

Murphy and Daley (1994), who adopted a-priori approach, used selection criteria for logistical segmentation analysis of companies in the US. The authors used

three of the five major variables in the nested approach. Location is used as demographic variable, primary mode of transport is used as operating variable, and participant's job responsibilities is used as purchasing approach. The authors found that selection criteria of purchasing managers do not change a lot based on their companies' location. On the other hand, the study found that sea mode customers and other modes customer have different rankings of selection criteria in terms of reliability and service quality.

The study of Lu et al. (2005) performs a segmentation analysis regarding website services of container shipping companies. The authors adopt post-hoc approach and conduct the segmentation based on website service requirements of shippers in Taiwan. The service requirement factors are "transaction services, market information services, support services, performance information services, and equipment information service". The names of the four segments found in the study are "support and performance service oriented firms", "equipment information oriented", "performance information oriented", and "transaction services oriented". Level of turnover, user status (yes or no), main export cargo, and nature of business (trading or manufacturer) are the profiling variables in the study. Level of turnover and main export cargo are the profiling variables that statistically show difference among segments.

Post-hoc approach segmentation is adopted by Arunotayanun and Polak (2010) as well. The authors attempted to explore homogenous subgroups of shippers in Indonesia considering their transport mode choice behavior. They handle the issue of transport choice with a perspective of random utility theory and segmented the market with latent class method. The variables used to segment the market are cost, time, quality, and flexibility. The authors first compared importance given to these variables based on commodity type (a-priori) and concluded that even though commodity type explains the taste heterogeneity of shippers to some extent, it is not very adequate. The segments in the study are neither given a name nor explained in detail.

Tsai et al. (2011) segmented high-tech product shippers of air transport market in Taiwan. Following a post-hoc approach and latent class model, the segmentation analysis was carried out based on six strategic variables (pricing,

damage claim, punctuality, security, exceptional management, and channel) and firm demographic variables (shipment destination, shipment size, shipment frequency, time, and product status). Shipment destination and size are found to be the only significant ones affecting segmentation, and size has more influence than destination. Although a thorough methodology is applied, similar to study of Arunotayanun and Polak (2010), who also applied latent class, the authors do not explain the characteristics of segment in detail and do not dedicate a name for the segment.

Chao et al. (2013) segmented the air freight market focusing on freight forwarders as the customers of airlines. The service requirements are used as the segmentation bases. These bases are assurance services, promptness services, empathy services, convenience services, value added services, and customization services. Among these service factors, it is questionable whether the variables under value-added services represent the value added services indeed. This factor includes “freight rate”, “cargo safety”, and “flexibility in rate adjustments”. Freight rate and cargo safety are the basic elements of a transportation service. The names of the segments are “professional service-oriented air freight forwarders”, “express service-oriented air freight forwarders”, and “empathy-oriented air freight forwarders”. Though the authors have done a very successful segmentation process, the analysis fails to include main descriptors of the segments i.e. industry, size of companies, destination, and value of cargo etc.

Wen and Lin (2015), the most recent freight market segmentation study in our literature review, performed market segmentation analysis with ocean freight forwarders working on the line between Taiwan and southern China. The segmentation analysis was performed based on the service attributes factors: “reputation/knowledge”, “freight charge/response”, “information technology”, and “communication”. The study generated two segments and the authors stated that these two segments also show statistical differences in terms of company size, company capitals, length of company history, and average monthly container volumes. Although it is quite useful to illustrate these differences, a more-detailed chi-square analysis (post-hoc tests) would be needed to better understand the relationship between sub-categories of descriptors and the segments. The authors have successfully provided positioning strategies for container lines in the study.

3.2.2.2 Segmentation Methodologies in Freight Transport Literature

The details of the freight market segmentation are shown in the Table 14. Majority of the segmentation methodologies in freight transport consist of the combination of factor analysis and cluster analysis, which is followed by either ANOVA or chi-square analyses. Two of the studies develop an econometric model and apply latent class model to segment the market. One study only compares the rankings of selection criteria. Total number of responses varies between 51 and 351 with an average of 157. Number of segment found out changes between 7 and 2. Considering the studies that implement combination of factor analysis and cluster analysis, it is noticed that none of the studies carried out confirmatory factor analysis to ensure validity and reliability of the factors.

Table 14: Segmentation Methodologies in Freight Transport Literature

Author	Analysis methods	No of segmenting variables	No of respondents	No of factors	No of segments	scale
McGinnis, 1978	Factor analysis, cluster analysis, One-way ANOVA, T-Test	31	351	7	7	N/A
Collison, 1984	Factor analysis and comparison of mean values of each predetermined segments	25	52	5	N/A	5
Matear and Gray, 1994	Factor analysis, cluster analysis, cross-tabulation	17	132	5	3	5
Murphy and Daley, 1994	Comparison of rankings of selection criteria	8	51	NA	NA	NA
Lu et al., 2005	EFA, Cluster (Hierarchical), canonical discriminant analysis, Anova, chi-square	24	85	5	4	7
Arunotayanun and Polak, 2010	Stated preference and latent class	4	186	NA	3	NA
Tsai et al, 2011	Nested logit model and latent class model	6	282	NA	2	5
Chao et al., 2013	Cluster analysis, One-way ANOVA (clusters and factors)	36	125	6	3	7
Wen and Lin, 2015	Factor analysis, cluster analysis, correspondence analysis with contingency tables (for positioning)	23	156	4	2	7

McGinnis (1978), following a post-hoc approach, applied factor analysis on total 31 variables and revealed total 7 factors. Then factor scores are used in cluster analysis. One-way ANOVA was performed to illustrate if several product and traffic characteristics significantly vary between the segments. Total number of responses in this study was 351. The study does not disclose the scale number used in the questionnaire. The paper does not mention if the factors are reliable and valid or not.

Collison (1984) applied factor analysis on 25 variables and reveal total 5 factors. Then means of factors are compared visually on a graph to see if some differences exist between different customers. In this study, the total number of responses was 52. The scale-point of service attributes was 5.

Matear and Gray (1994) adopted post-hoc approach and applied cluster analysis following a factor analysis. The cluster analysis used the factor scores as the segmentation bases. Number of observed variables was 17 while the number of factors was 5. The total number of respondents was 132, and the scale point was 5. On the other hand, a-priori based segmentation analysis of Murphy and Daley (1994) compared the rankings of respondents on the eight selection criteria. Total number of responses was 51.

The analysis of Lu et al (2005) first performs exploratory factor analysis and then cluster analysis based on factor scores. Total 24 variables are reduced to 5 factors, and 4 segments are found out. Cross-tabulation is conducted with segments and profiling variables in the analysis. Discriminant analysis is also conducted. Total number of responses was 85 and scale-point of the service requirement questions is 7.

Arunotayanun and Polak (2010) applied multinomial logit model and latent class analysis for segmenting the market. They collected the data in the form of stated preference experiment from 186 shippers, which resulted with total 1487 observations. Since it is not possible to include large number of variables in stated preference experiment, the authors employed small number of variables in the analysis.

Tsai et al. (2011) conducted nested logit model for identifying the competitive structure of air freight market and found two nests as express nest and

forwarder nest. Then the authors apply latent class to reveal the segments of the market, and choice probability of segments in term of the nest selection. Total number of response in this study was 282.

Cheo et al. (2013), on the other hand, carried out factor analysis on 36 observed variables and revealed total 6 factors explaining service requirements of air freight forwarders. The number of total respondents in the study was 125. Upon factor analysis, the factor scores were used in cluster analysis. Then, the authors performed one-way ANOVA test between the segments and service factors, which were used to segment the market.

Win and Lin (2015) conducted factor analysis on 23 variables and generated total 4 factors that explain service attributes of ocean freight forwarders. Similar to previous researches, the authors used factor score to apply cluster analysis. Then, they applied chi-square analysis to indicate association between the segments and descriptors. In addition, the authors applied correspondence analysis based on the performance scores of container lines. The survey of this study was replied by 156 respondents and the scale-point of items was 7.

3.2.3 Empirical Segmentation Studies in Passenger Transportation

This part investigates the segmentation studies in passenger transportation market with an empirical application. Since passenger transportation studies are quite large in terms of number, it is decided to investigate only the studies after the year of 2000. This is also coherent with the purpose of investigating passenger transport (to see recent methodologies in a consumer market which is similar to freight transport). Only the journals that are indexed in Web of Science are taken into consideration.

3.2.3.1. Segmentation Approaches, Purposes, and Bases in Passenger Transport

Among the 16 studies in our review, 15 of them adopt post-hoc approach in segmentation analysis. This characteristic of passenger transportation research is different than B2B and freight transport segmentation research, in which post-hoc approach does not dominate the literature to this extent. None of the passenger

segmentation literature in our review is specifically focused on water transportation. They are mostly related to public transportation, road transportation, and air transportation. The studies are contemporary as the last 5 papers are published in 2016 and later on.

Table 15: Empirical Segmentation Studies in Passenger Transport

Author	A-priori / Post hoc	Objective / Purpose / benefit of segmentation	Bases
(Ryley, 2006)	Post-hoc	To consider links between non-motorized mode use and life stage	socio economic variables
(Loo, 2008)	A-priori	To analyze airport choice of passengers	Purpose of Trip and Haul range
(Shiftan et al., 2008)	Post-hoc	To determine attitudes that drive each segment's mode choice	Attitudinal variables
(Diana and Pronello, 2010)	Post-hoc	N/A	Response categories (nominal)
(Martinez-Garcia and Royo-Vela, 2010)	Post-hoc	To identify characteristics of travelers using low-cost airlines and their flight preferences	attributes of flight and accommodation
(Prillwitz and Barr, 2011)	Post-hoc	To develop the notion of sustainability related mobility styles for applying targeted social marketing policies	Attitudes towards public transport, car use, walking/cycling, holiday traveling, transport measures, and sustainability and environment
(Cools et al., 2012)	Post-hoc	To better tailor policy makers' future actions	Agreement and ranking of respondent to statements
(Li et al., 2013)	Post-hoc	Developing specific policies for increasing the bicycle usage	Attitudinal factors Age, travel time, trip satisfaction, regularity of visiting campus,
(Jacques et al., 2013)	Post-hoc	To uncover types of commuters	
(Budd et al., 2014)	Post-hoc	To identify those with the greatest potential to reduce their car use	Attitudinal factors
(Fürst, 2014)	Post-hoc	Targeting groups to suggest customized strategies for greening the way to and from university	Attitudinal variables
(Mohamed et al., 2016)	Post-hoc	To identify likely electric vehicle adaptors	Socio-economic Demographics

Table 15 (Continued)

Author	A-priori / Post hoc	Objective / Purpose / benefit of segmentation	Bases
(Araghi et al., 2016)	Post-hoc	To design policies suitably tailored to target the latent segments	Product attributes (ticket price, Cox offset contribution, luggage allowance, eco-efficiency)
(Fu and Juan, 2016)	Post-hoc	To demonstrate how a certain characteristic influences time-allocation behavior distinctively across latent segments	Attitude towards public transport
(Haustein and Møller, 2016)	Post-hoc	To identify distinct subgroups among e-bikers and promoting e-bike use in a targeted and more effective way	age and attitude
(van Lierop and El-Geneidy, 2017)	Post-hoc	To better understand the complexities of different groups who use transit	attitude of passengers to transit public transportation

The purposes of passenger transportation show variety. One of the common benefits of segmentation in the literature is policy development. For instance, Cool et al. (2012) aim to tailor policy makers' action to reduce private car usage in Belgium. Li et al. (2013), on the other hand, apply segmentation analysis on people in China to be able to develop targeted policies for increasing the bicycle usage. In fact, although the purpose statements of the studies in our literature review do not clearly specify the word "policy", almost all of them aim to develop policies, especially for achieving a greener transportation of public.

An example to this is the study of Budd et al. (2014) who try to explore the segment that is willing to reduce personal car usage to commute to the airport. It actually aims to develop new policies to promote a greener alternative, public transportation, for reaching to airport. Another example belongs to the research of Furst (2014) who discover the segments of university students with regard to transportation from and to the university. In this way, customized strategies can be targeted to members of each segment to greener transport options. In a very recent study, van Lierop and el Geneidi (2017) highlighted the importance of transit usage in terms of environment, and discovered the segments for promoting transit usage to right groups by understanding the complexities of different groups with regard to transit usage.

One exception belongs to the study of Garcia and Vela (2010) who do not aim to provide a transport policy for a greener environment. The authors perform segmentation analysis on low-cost air travelers. The purpose of that study is to identify characteristics of low-cost airline carrier users and find out the segments of this market.

The bases used in the passenger transport literature are mostly similar to each other. The bases that studies use to investigate the segmentation are attitudes of passengers towards the attributes of travelling or public transport. There are some exceptions to usage of attitudes on travelling attributes as the basis of segmentation analysis. For instance, Loo (2008) utilized purpose of travel and haul range as the segmentation bases. Ryley (2006) and Mohamed et al. (2016) used socio economic variables as the main basis of segmentation analysis in their studies. Age is also accompanied as the segmentation base in some studies van (Jacques et al., 2013; Lierop and el Geneidy, 2016).

3.2.3.2. Analysis Methodologies in Passenger Segmentation Literature

Considering the analysis methodologies, passenger segmentation studies show diversity. Many of the studies are similar to the ones in B2B and freight transport, in which a combination of factor analysis and cluster analysis are employed. Then, further analyses are conducted such as ANOVA or chi-square tests to profile the segments. Among the 16 studies, six of the studies follow this statistical analyses package. Two of the studies, perform confirmatory factor analysis in addition the exploratory factor analysis, and then conduct structural equation modeling (Li et al., 2013; Shiftan et al., 2008).

Table 16: Analysis Methodologies Used in Passenger Transport Segmentation

Author	Analysis methods	No of segmenting attributes	No of respondent	No of factors	No of segments	scale
(Ryley, 2006)	Cluster analysis (Hierarchical)	6	4016	NA	10	N/A
(Loo, 2008)	Stated preference data and multinomial logit	N/A	308	NA	6 and 3	N/A

Table 16 (Continued)

Author	Analysis methods	No of segmenting attributes	No of respondent	No of factors	No of segments	scale
(Shiftan, Outwater, & Zhou, 2008)	EFA, CFA, SEM, Cluster analysis	37	522	7	8	10
(Diana & Pronello, 2010)	Correspondence analysis	5	648	N/A	3	N/A
(Martinez-Garcia & Royo-Vela, 2010)	Cluster analysis and chi-square	10	808	N/A	4	5
(Prillwitz & Barr, 2011)	EFA, cluster, chi-square	78	1561	14	4	5
(Cools, Brijs, Tormans, De Laender, & Wets, 2012)	Cluster analysis	42	33	N/A	4	N/A
(Li, Wang, Yang, & Ragland, 2013)	EFA, CFA, SEM, Cluster, Cross-tabulation	29	639	4 (8)	6	5
(Jacques, Manaugh, & El-Geneidy, 2013)	EFA and Cluster analysis	6	4697	N/A	21	N/A
(Budd, Ryley, & Ison, 2014)	EFA, cluster analysis	44	848	9	8	5
(Fürst, 2014)	EFA, cluster, ANOVA,	46	28000	9	6	0 - 100
(Mohamed, Higgins, Ferguson, & Kanaroglou, 2016)	SEM, Cluster	12	3505	NA	3	NA
(Araghi, Kroesen, Molin, & Van Wee, 2016)	Stated preference and factor analysis, latent class model	4	261	4	5	N/A
(Fu & Juan, 2016)	EFA, cluster, ANOVA, SEM	10	6687	3	3	5
(Haustein & Møller, 2016)	EFA, cluster, ANOVA, Kruskal Wallis	13	427	4	3	5
(van Lierop & El-Geneidy, 2017)	Cluster analysis (K-means)		14842 / 29224	10	9	10

Four of the studies only conduct cluster analysis for segmenting the passengers. As expected, the number of segmenting variables is usually relatively smaller comparing to the ones that employ factor analysis. Distinctively, one study applies correspondence analysis (Diana and Pronello, 2010). The authors in that

study asked respondents to choose the best statement that describe themselves regarding the issues of cost, comfort, and speed. Then, the authors conduct correspondence analysis based on these categorical variables. Two of the studies, on the other hand, utilize stated preference data to segment the market. For instance, Loo (2008), used 8 airport selection criteria to collect stated preference data and then segmented the passengers through the a-priori approach. Finally they carried out multinomial logit to predict these a-priori segments.

As shown in Table 16, the number of respondents in passenger transportation is much larger than the ones in B2B and passenger transport. Among the ones which use survey to collect data, the minimum number of respondents is 261 while the largest number is 29,224. The mean of number of respondents in our review is approximately 5,467. Number of segments change between 3 and 10 with an average of 6,4. Majority of the scale-point used is 5-point while a few of them are 10-point.

3.4 DISCUSSION OF SEGMENTATION METHODOLOGY IN THIS DISSERTATION

As discussed in Chapter 2, container shipping business has a complex structure in terms of the competition (the lines need to compete and cooperate with their rivals) and the diversity of customer types and expectations. Considering the literature review of market segmentation both in b2b, freight transport, and passenger transport, the recent studies mostly adopt the post-hoc approach in which segments are not determined by the researcher but explored through the analyses. The most common and well recognized method to explore segments of a market is cluster analysis in the literature.

The cluster analysis is performed by using either observed variables or latent variables following a factor analysis. As shown in Chapter 2 under the title of “Service quality and selection criteria in container shipping”, container shipping service attributes consist of a large number of variables because the service multiple dimensions. Hence, this dissertation also needs to include significant amount of variables to be able to mirror the service attributes of container shipping that shippers consider. The studies that only utilize cluster analysis usually segment the market

with small number of variables. The ones that have large number of variables usually perform factor analysis and use the factor scores.

Considering our literature review of freight transport, there is a critical issue regarding studies that employ exploratory factor analysis and then cluster analysis. None of these studies assess the validity of the factors, and the reliability is evaluated by only checking the Cronbach's alpha value. In segmentation analysis, the bases are very critical. They have to be both theoretically and statistically appropriate for segmentation analysis. Therefore, the validity and reliability of the factors should be assessed with the help of confirmatory factor analysis.

Another issue that needs to be taken into consideration is the bases used for segmentation. When evaluating the bases in freight literature, McGinnis (1978), for instance, used market competitiveness and external influencers as the segmentation base in addition to service attributes. It is correct that market competitiveness can influence the expectation of customers on service attributes. However, it does not reflect the exact customer needs and wants. This kind of variables can be used as the descriptors of segments rather than the bases of segments. For sure it can be used as the segmentation base if the aim is to segment the customers based on their market competitiveness. Yet, if it is to segment customers based on the benefits they receive, then market competitiveness and similar variables are not really very appropriate.

Naming and describing segments is also a major concern that needs to be addressed well. In our literature, Arunadoyanun and Polak (2010) do not appoint a specific name for the segments. Tsai et al (2011), on the other hand, do not explain the characteristics of segment in detail. Chao et al (2013) do not include descriptors such as size, industry, and destination to define the segments in detail. In the light of these concerns, this dissertation should appoint appropriate names for each segment and includes sufficient and effective descriptors which should be statistically significant.

Among the methodologies, latent class segmentation that uses stated preference data is also used by some studies. This methodology is contemplated if it can be an ideal methodology to segment the container shipping market. Based on the random utility theory, the respondents are asked to choose the most ideal product or service option for them. Each product or service option has some levels of attributes

such as cost, reliability, and delivery time. However, only a small number of variables can be utilized in stated preference method. Teichert et al. (2008) claimed that stated preference methodology is more appropriate for a new product or service development. In container shipping, stated preference methodology can be applied for a single route and a certain container type and size should be determined by the researchers. The aim must also be very specific. This methodology can be a very effective segmentation analysis tool for a container line that plans starting a new service to a specific new route. Based on the latent class segmentation derived from stated preference data, the line can choose its target customers, and in this way, the line can decide on to whether have direct or transshipped services to this location, frequency of services, and also the price.

Since normative segmentation models do not meet the requirements of practice, and therefore not used by practitioners (Kalafatis and Cheston, 1997), before conducting a statistical segmentation analysis, a qualitative research is necessary to thoroughly investigate the segmentation practices of container shipping lines. Conducting a qualitative study will help to understand if shipping lines apply market segmentation and how they apply, which bases they use, and the purposes they adopt to segment the market.

Overall, the segmentation methodology in this study should first investigate the segmentation applications of container lines through a qualitative study. It should also adopt the post-hoc approach to discover the segments in the container shipping market. However, these segments must be described by the appropriate profiling attributes such as industry, cargo value, and firm size etc. so that they can be identifiable and accessible by the container lines.

CHAPTER FOUR

APPLICATION OF MARKET SEGMENTATION IN CONTAINER SHIPPING

This chapter is the empirical part of thesis which consists of three sections. The first one is the qualitative study which investigates the segmentation applications of container lines located in Izmir. It explores which segmentation bases the companies utilize, which segmentation purposes they aim, and which approach they adopt. A theoretical port-specific segmentation model is proposed for companies who prefer using a-priori approach. The second part carries out a quantitative segmentation analysis following a post-hoc approach. It consists of several methodologies including measure development of selection criteria, cluster analysis, and contingency tables. Total six post-hoc segments are discovered and a thorough discussion is provided. The third section compares tests whether a-priori segments of container lines in practice shows significant differences in terms of container line selection criteria. A comparison between a-priori segments in practice and post-hoc segments is provided

4.1. A QUALITATIVE STUDY OF MARKET SEGMENTATION IN CONTAINER SHIPPING: A THEORETICAL MODEL

Extended version of this qualitative section has been published at Management Research Review with the name of “*Market segmentation in container shipping services: A qualitative study*” (Balci and Cetin, 2017). Any citation of this specific section should be based on the journal publication.

4.1.1 Methodology

The purpose of this study is to develop a segmentation framework that can help container lines to profile each customer more efficiently considering their needs, strategic importance, and demographics. The B2B segmentation literature suggests assessing the practical implementation and requirements regarding segmentation at an industry. Thus, to have an understanding of industry, 20 semi-structured

interviews were conducted with professionals in container line companies to collect primary data. The interviewees were selected based on judgmental sampling to ensure respondents were capable of answering the research questions of the study (Malhotra, 2008). Interviews were carried out with container lines operating in Izmir-Turkey.

In the interviews, questions were first probed to understand the profiles of the container lines, including their services, annual Twenty-foot equivalent unit (TEU) rates, and their representation status in the region. Then, questions were probed regarding the characteristics of their customers, how they manage customer relations, and how they customize their services. Issues related to segmentation applications in practice, including the bases and purposes thereof, were asked to interviewees. Finally, the list of potential segmentation purposes and bases were shown to respondents, to discuss their appropriateness in container shipping, as well as for their organizations. Upon completion of the interviews, opinions of 10 of the interviewees were asked to evaluate the framework developed in this paper. Respondents found the framework comprehensive, flexible, and feasible as a successful template for container lines.

15 of the interviews were done face-to-face, while 5 of them by a telephone call. 13 of the face-to-face interviews were recorded while none of the phone conversations was recorded, but detailed notes were taken. The face-to-face interviews lasted approximately 45-70 minutes while phone interviews lasted around 20 minutes. Phone interviewing was chosen for five interviewees due to time restrictions of the interviewees. These interviews were reserved at the end, foreseeing that theoretical saturation could be reached for some categories and themes in the first 15 interviews. Indeed, saturation was achieved for most categories, and these interviews only asked about company profiles, segmentation approaches, and discussion of possible segmentation bases. The recorded interviews were listened carefully twice, and the portions found to be relevant and useful were transcribed (Bryman, 2012).

Izmir is a major port, serving a large hinterland in the west part of Turkey. There are four container ports in Izmir at the moment, as of Dec 2018. In Izmir container terminals, total 764.548 TEU were exported, and 725.138 TEU were

imported by sea in 2018. Containerized cargoes loaded and discharged at ports in Izmir vary considerably. There are in total 13 different main commodity groups, with subdivisions given in the statistics of the Aegean Export Union. Most common ones are cable, electronics, fresh and dried foods, machines, minerals, textile, automotive parts, and tobacco.

4.1.2 Findings

4.1.2.1 Practical Implementation of Market Segmentation in Izmir

The interviews indicated that the decision of container lines whether to apply a segmentation program, the purpose of segmentation, and the bases that container lines use for segmentation depend on container volumes, the number of routes served, the organizational structure of liners and other company policies. Container lines with large quantities in the region tend to adopt segmentation programs more than lines with smaller volumes. Several bases implemented in practice in the area, as well as potential bases that might be used by liners in the future were explored in the interviews. Bases used for segmentation are the type of customer, container volumes, loyalty, seasonality, decision maker, the industry of shipper, container type, destination region, and export/import, depending on the purpose of segmentation and the capabilities of liners.

Table 17: Profile of Interviewees and Segmentation Bases Used in Practice

Pseudonym of the Lines	Position of Interviewee(s)	Size of the lines*	Represented by direct or third party agent	Segmentation Bases (if applied)
A	Sales Manager	Large	Direct	-Destination region
B	Branch Manager	Large	Direct	-Destination region -Industry of shipper
C	Branch Sales Manager	Large	Direct	-Customer size -Container type (reefer) -Industry of shipper -Forwarder/shipper
D	Sales Executive	Large	Direct	-Customer size -Forwarder/shipper

Table 17 (Continued)

Pseudonym of the Lines	Position of Interviewee(s)	Size of the lines*	Represented by direct or third party agent	Segmentation Bases (if applied)
E	Export Manager and Line Manager	Large	Direct	-Destination region -Customer size -Industry of shipper -Container type (reefer)
F	Business development manager and Business development manager	Large	Direct	-Forwarder/shipper -Customer size -Loyalty -Container type (reefer) -Decision maker
G	Branch Manager	Med.	Direct	-Customer size -Forwarder/Shipper
H	Line Region Manager	Med.	Third P.	-----**
I	Sales Manager	Med.	Direct	-----
J	Line Manager and Sales executive	Med.	Third P.	-----**
K	Marketing Manager and Sales Manager	Med.	Third P.	-----**
L	Agency General Manager	Med.	Third P.	-----**
M	Line Manager	Med.	Third P.	-----**
N	Branch Manager	Med.	Third P.	-Customer Size
O	Sales Manager	Med.	Third P.	-----
P	Sales Executive	Small	Third P.	-Customer Size
R	Agency Manager	Small	Third P.	-----
S	Branch Manager	Small	Third P.	-----**
T	Branch Manager	Small	Third P.	-----
U	Branch Manager	Small	Third P.	-----

*Size of the liners is determined based on annual TEU. Small: 0-9.999TEU, Medium: 10.000-49.999, Large: 50.000+

**Liners that do not have segmentation program but are willing to have a template of different customer segments for customized marketing offering

The bases shown in Table 17 belong to companies that have regular market segmentation programs. Companies that apply market segmentation in a more systematic way use a combination of different bases for different purposes. Similar to

findings of Abratt (1993), who investigated segmentation practice of industrial marketers in South Africa, the container lines use basic identifiable bases, such as industry, size, and customer type, to segment their market.

Although some small-scale lines do not practice a systematic segmentation program, they intuitively segment customers based on their size, industry, loyalty and destination region, so as to forge more effective customer relations. These segments are not revealed nor treated methodically, and no systematic marketing strategy, customized to different segments, is applied. An interviewee stated that *‘if we had much larger container volume in this region, and a larger organization, we would have segmented our customers. Instead, we have some segments in our mind’*. According to other interviews, these companies do not implement systematic segmentation program because their container volumes and organization size are not sufficient. However, these companies stated that a template of customers in different industries and characteristics, illustrating expectation differences, would help to provide customized marketing offerings such as service, price, service quality, and marketing communications.

4.1.2.2 Segmentation Purposes in Container Shipping in Aegean Region

The purpose of implementing segmentation varies according to the size of the line, operational and marketing objectives, and company goals. Thus, the bases used for segmenting the market usually depend on the purpose of segmentation. For instance, container lines applying destination region based segmentation aim to achieve more effective booking and after sales services, such as container tracking and claims to handle. Company B said *“if we don’t segment the market based on destination, then every sale representative focuses on the busiest routes. Besides, our sales operation has also become smoother”* On the other hand, the purpose of segmentation based on customer size is to manage profitable customers better, as well as ensure their satisfaction which, in return, may lead to better capacity utilization in vessels.

The segmentation purposes of liners are thus presented first in Table 18 below, and then we explain the segmentation bases.

Table 18: Purpose of Market Segmentation Stated by Container Lines

Purpose of market segmentation stated by container lines
• Determining specific needs and wants of different customer groups • Effective management of high volume customers • Exploring new and profitable customers • Customized marketing communication (for convincing at first visit and building long term relationship with customers) • Effective price discrimination • Smoother sales and customer service organization • Training new marketing personnel • Using marketing and operational resources more efficiently • Developing new services and improving existing services

Source: Derived by authors based on interviews

The purposes stated in Table 18 are interrelated. For instance, determining specific needs and wants of customers is used for customized marketing communications, effective price discrimination, developing and improving services, training new sales personnel, and effective management of high volume customers. An interviewee best explains this interrelated situation as *‘The most significant difference by which we can outperform our competitors is the relationships we built with our clients. For doing this, we must have customized marketing communications, and for having effective communications, we must understand needs and wants of customers in different groups’*. This statement of the interviewee is parallel to findings of Maloni et al. (2016) who also suggest that relationship positively affects the success of container lines.

All of the purposes stated in Table 18, except one of them, are directly or indirectly mentioned in the segmentation literature (Assael, 1993; Boyt and Harvey, 1997; Dibb, 1998; Kotler and Armstrong, 2010; Rangan et al., 1992; Weinstein, 2013). To the knowledge of authors, “training new marketing personnel” has not been mentioned as a benefit of market segmentation in previous studies. Newly-hired and inexperienced marketing personnel can be trained about the distinct needs and wants of customers in different industry, destination, product, or container type groups.

Customized marketing communications were found necessary in the interviews for nourishing customer relations and succeeding in sales for the first time

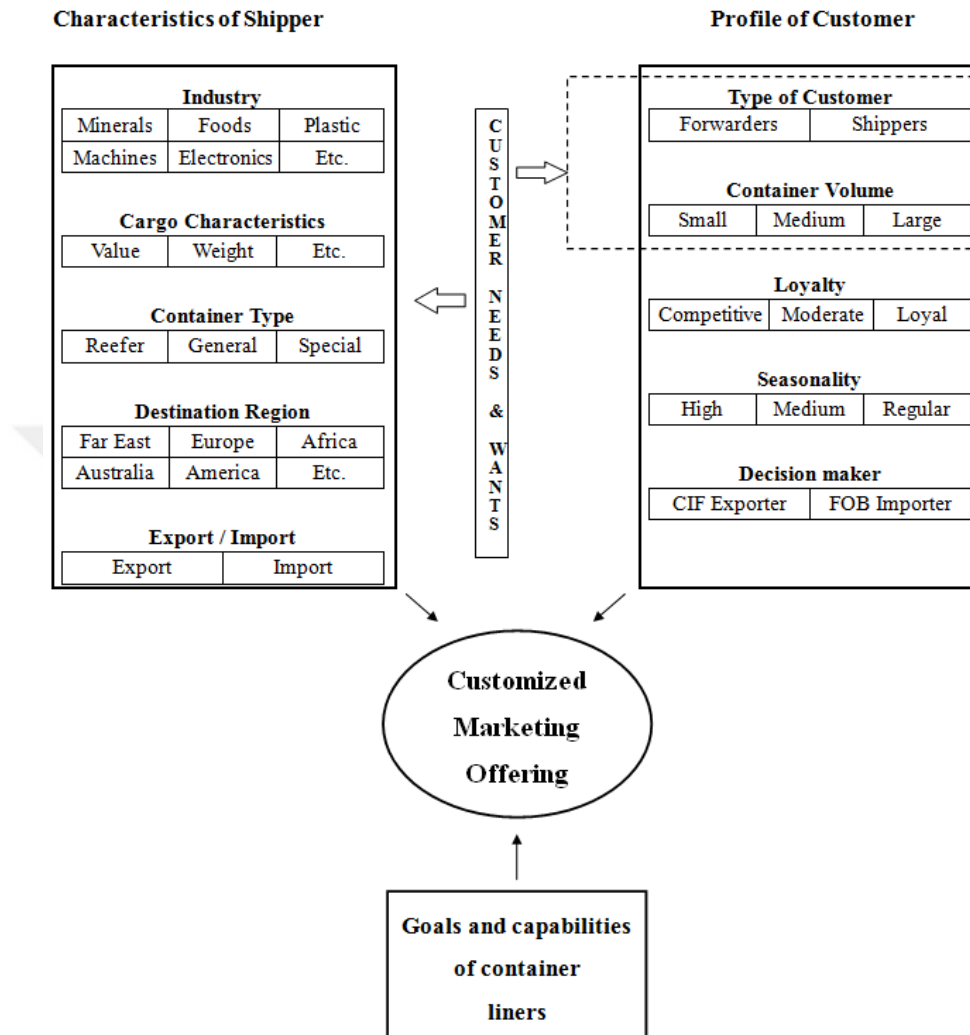
customer visits. For instance, some of the container lines provide pallet-wide containers which are a few inches wider than the usual container, to take more pallets. Customers who may need this equipment can be detected via segmentation and this strength of the container line can be stressed in marketing communications. Carriers may also enjoy premium charges by discriminating the price. Segmenting customers in industrial services where a significant number of customers exists, like container shipping, can be a useful tool for relationship marketing. Some of the lines not applying any segmentation model stated that they would be willing to implement industry based segmentation for this reason, without changing their organizational structure.

An important purpose of market segmentation stated by container lines is to implement effective pricing strategies. Industry specific freight tariffs are not in practice anymore, but some container lines still carry out price discrimination based on industries. Factors affecting price discrimination for the same destination, as stated by interviewees, are volumes, the loyalty of customers, container type, characteristics of goods and weight of goods.

4.1.2.3 A Proposed Framework for Carriers' Port-Based Market Segmentation

A segmentation framework has been constructed by considering the finding in the interviews and concerns in the literature review. The framework is built by considering the practices of container lines, the discussion of segmentation bases, and aims of segmentation in container shipping. The framework is flexible in the sense that companies can choose any combination of bases illustrated in Figure 13. Container lines can decide these categories according to their service and port's hinterland characteristics. The lines can evaluate each customer by considering the customer's category within the bases e.g. medium in container volume base, competitive in loyalty base, foods in industry base, and the Far East and Europe in Destination base. Accordingly, customized marketing program can be implemented for each customer.

Figure 13: A Framework for Port-Based Market Segmentation of Carrier in Container Shipping.



The boxes under each base are only used as an illustration. The options under each base can be changed or increased depending on the line's company and market structure. To briefly explain, 'Profile of Customer' is used to define the type of customer and determine the importance of individual customers for the container line. By considering these bases, container lines can plan their marketing activities annually and adjust their services accordingly. 'Characteristics of Shippers' identify characteristics of shippers with five parts: Industry of shippers, cargo characteristics, container type, destination region and export/import. 'Characteristics of shippers' are

used for detecting specific needs and wants of shippers in different groups together with 'type of customer' and 'container volume' under profile section.

As mentioned previously, the bases that are going to be selected for segmenting the market depend on the purpose of segmentation. Assuming the purpose is effective price discrimination, three considerations of lines exist: Trade imbalance in some routes, capacity fulfilment rate of customers, and price sensitivity of customers. First, to tackle trade imbalance problem, carriers may attract shippers whose destination region needs empty container positioning. Destination region based segmentation helps to detect these customers and offer attractive freight, such as carriers decrease freight rates from North America and Europe to the Far East. Second, to increase capacity utilization, carriers may promote incentives on freight rate for large volume and loyal customers. Carriers may also evaluate shippers based on the weight of their cargoes and apply price reduction for shippers that have light loads. Third, the trickiest one, carriers can explore price sensitivity of shippers in different segments, in other words, the trade-off between freight and other service attributes such as time, reliability, availability of special equipment or safety. By this way, carriers may enjoy premium charges through performing superior on attributes other than freight.

The market of shippers and container type can be utilized to segment market for price sensitivity. If these two bases do not define the value, then a segmentation based on cargo value may be necessary too. In fact, effective price discrimination can be accomplished by evaluating each customer considering all of the price-discrimination bases. Carriers should define each shipper concerning their container volume, loyalty, destination region, container type, and market and consider their goals and capabilities for effective price discrimination.

As B2B marketing literature stresses the importance of personal relation and communication, liners may also implement segmentation for customized marketing communication. For an effective customized marketing communication, carriers first should reveal preferences of different segments on service attributes of container shipping service. Then, they should define each shipper considering all bases shown in the above framework. Finally, by considering the profile of the customer, which exhibits the type and strategic importance of customers, carriers can decide the

degree of communication, i.e. how many times to visit per year or call per week. Once again, goals and capabilities of container lines should always be born in mind.

Type of Customer

Two basic customer types of container lines exist: Shippers and forwarders. Forwarders are often considered to be a different kind of customer, sometimes viewed as trading partners with the various preferences on service attributes. Considering especially the large volume forwarders bring to lines, specialized personnel at lines are often assigned to them to tackle all issues. An interviewee indicated the importance of forwarders as *‘when we support forwarders through some privileges such as equipment priority and flexibility in payment, they can bring too many shippers at a short time’*.

Forwarders and shippers may also diverge according to their priorities on attributes of container lines’ service offering. In other words, the needs and wants of these two types of customers differ from each other as shown in Figure 13. These differences should be revealed by the container lines. Interviewees stated that shippers might be segmented based on their industry, destinations, export-import, container type and loyalty. Understanding expectations of these segments also assists in marketing forwarders, as shippers are also customers of forwarders. Size and loyalty can be used for segmenting both shippers and forwarders.

Size of the customer (container volume)

Since filling the capacity of a vessel is vital for container lines, the size of the customer translates in the number of containers this client ships annually. The interviewees stated that they consider the number of container regarding the size of customers. The size of customer is used by the majority of the lines in the interviews. The companies that do not systematically segment the markets stated they intuitively segment the customers according to their size. The size of the customer helps in providing customized marketing offering, specifically including service levels and pricing based on the annual container volumes of customers.

Some of the lines appoint specific personnel to each client in the large volume segment, while others state that although they do not do so, or do not determine segments for volume, they always pay more attention to services provided to such customers and customize their marketing offers accordingly. For instance, companies D and E provide periodical reports for key accounts, to quantitatively evaluate performance, in addition to attractive freight offerings, equipment priorities, and dedicated personnel. Segmentation based on customer size can also be useful for smooth operations as dedicated staff tackles each of the segments.

Customer needs and wants can also change based on the size of customers as illustrated in Figure 13. For instance, it was frequently mentioned in the interviews that large customers can be more sensitive to the number of available empty equipment than the small customers. In the literature, Collison (1984) also found that large and small customers in terms of annual tonnage had different attitudes on service attributes of container shipping. The results of that study indicated large customers tended to be more concerned of timeliness of service. Wen and Lin (2015) found two segments of freight forwarders: one consisted of usually large forwarders while the other consisted of small forwarders. Significant differences were found between these two segments in terms of preferences on service attributes of container lines.

Loyalty

Despite the fact that larger customers receive more attention, it does not mean that smaller ones do not receive any. Each and every one of the smaller customers is crucial for filling the ship. Relationship with smaller customers is of particular importance in the case of losing a large client. An interviewee states '*With the small vessel capacity we have, if we fill the ship with only a few customers then it is quite a risk for us*'. As a result, container lines also appreciate customers whose volumes are not large but who are loyal to the line. Therefore, loyalty should also be evaluated in addition to size of customers to identify strategic importance of customers.

Seasonality

Interviewees in company F stated that an important aspect that should be born in mind is sustainability and regularity of annual container demand of customers. Seasonal and regular customers, they stated, should be treated differently. Seasonal customers, such as agriculture businesses, do not ship any cargo during the year except the peak season, and then they suddenly start shipping large amount of containers. The seasonal and regular customers should be segmented, so that, marketing and service design, as well as the operations, can be more effective.

Decision maker

To better direct lines' marketing effort, container lines need to determine who the decision maker is when it comes to selecting the carrier. The exporter of a shipment does not mean decision maker if sales agreement is in FOB terms which render importer to be the decision maker. Similarly, global shippers that have shipments and representatives in many different hinterlands exist around the world. However, global shippers select their carriers annually through tenders. Nonetheless, the service quality expectations of these companies should be met as well. FOB exporters could, for instance, be convinced to use other INCOTERMS if, at all possible, such as CFR, that makes them the decision maker.

Industry of shippers

The companies that segment their customers based on their industries stated that customers in different industries have distinct priorities. They stated that segmenting shippers based on their industries enables container lines to understand their priorities and business more precisely, to develop new services or to innovate existing services accordingly and to implement customized marketing communications. Earlier studies of B2B segmentation have used Standard Industrial Classification (SIC), but this was not found to be suitable for container shipping in the interviews. Instead, since each hinterland hosts shippers in different industries, a

hinterland-focused industrial segmentation base, determined by the container line, seems more appropriate. Companies that did not segment their market systematically stated that they would prefer this base, so as to reveal specific needs and wants of customers in different groups. Danielis *et al.* (2005) also found that shipper preferences diverse depending on their industries.

Segmenting the market based on the industry can also help container lines to segment the market, to some extent, based on cargo characteristics and container type. This can assist in dealing with seasonal cargo such as foodstuff, reefer cargo, and other perishables. Industry based segmentation can also demonstrate the type and size of containers needed for each industry. However, the industry of shipper may not always reveal cargo characteristics such as value, weight, and container type. Finer segments might be needed in addition to the industry of shippers.

Cargo characteristics

Characteristics of cargoes can be divided based on their value, weight per container, fragility, whether perishable or not, and whether dangerous or not. Cargo characteristics were not used for segmentation by interviewed companies, yet most interviewees suggested cargo characteristics can well define the specific needs and wants of shippers. When the industry of shipper does not effectively reveal distinct needs and wants, cargo characteristics can help container lines to finer segment their markets. For instance, the shippers in food and beverage segment vary significantly. Cargoes of some shippers may be highly perishable with high-value (frozen seafood) while others may be non-perishable with low value (seeds or grain). Figure 13 illustrates only two alternatives (value and weight) under this category, but more alternatives can be added by container lines according to the market structure at the port they serve.

Container type

Container lines may also use container type as a means of segmenting their customers. The usual practice in container shipping is to segment as reefer and dry

containers. However, other special container types, such as open-top, 45-foot container can also be evaluated.

Destination region

The interviews reveal that destination-based segmentation can be useful for container lines in several ways. First, the sales organization can be managed by destination regions, and this can smooth sales operations, bookings and claims handling. Second, since each destination region has its peculiarities, destination-based segmentation may be useful for container lines to comprehend customer expectations more effectively. Moreover, sales volumes in each region can also increase by setting different targets for sales personnel of each region. Destination-based segmentation might be especially appropriate for companies with services to a vast number of destinations. The disadvantage of this type of segmentation is that a shipper having shipments for multiple destinations must be in contact with different salespersons for each consignment. However, relationship marketing theory suggests long-term personal relations. Container lines that use this base appoint marketing staff for large volume customers to eliminate this problem. Destination based segmentation is not found to be appropriate for small-scale container lines that operate within a limited destination range.

Export/Import

The interviews suggest that exporters and importers at a port usually attach different importance scores on the attributes of container shipping service. For instance, importers may be more sensitive to free demurrage time provided at the discharge port. The difference between these two types of shippers should be found out by container lines.

In terms of the bases specified here, it is of significant importance to remind that container lines may choose any of these bases or combination of bases according to their purpose as well as company characteristics. The lines are not necessarily suggested to utilize all of the bases stated here.

4.1.3 Summary of the Qualitative Study

The literature frequently underlines that a gap exists between the academic literature and practical implementation of market segmentation (Freytag and Clarke, 2001; Boejgaard and Ellagaard 2010). According to Clarke (2009), one of the reasons of this problem may arise from the fact that academic papers do not usually thoroughly consider the structure, culture, activities, and resources in practice. Thus, this qualitative study is conducted to acquire deeper insights regarding the practical market segmentation applications of container lines in Izmir.

The segmentation bases used in practice are the type of customer, the size of customer, destination region, container type, the loyalty of customers, decision maker, and the industry of shippers. According to the interviews with managers of container lines, other potential bases that can be utilized are seasonality of shipments, decision maker, cargo characteristics, and whether the shipment is export/import.

The interviews suggest that the benefits of market segmentation in container shipping are various. Basic ones are: determining specific needs and wants of different customer groups, managing high volume customers effectively, adopting effective sales and customer service organization, training new marketing personnel, developing new services and improving existing ones, exploring new and profitable customers, and using marketing resources more efficiently. The results of this paper also indicate that majority of middle and small sized container lines in Izmir do not use market segmentation in a systematic way

This qualitative study also illustrates that the container lines adopt a-priori approach when segmenting their market. None of the sampled container lines adopt post-hoc approach by taking customer needs and wants into consideration. The theoretical segmentation framework in this qualitative research can be utilized by carriers who prefer adopting a-priori approach. Carriers may utilize a single base or a combination of multiple segmentation bases depending on their purpose. As shown in the segmentation template developed in this paper, customized marketing offering should be designed for customers considering customer segments regarding their strategic importance for carriers and specific needs and wants. Goals and capabilities

of the carriers should always be born in mind while taking action for different segments.

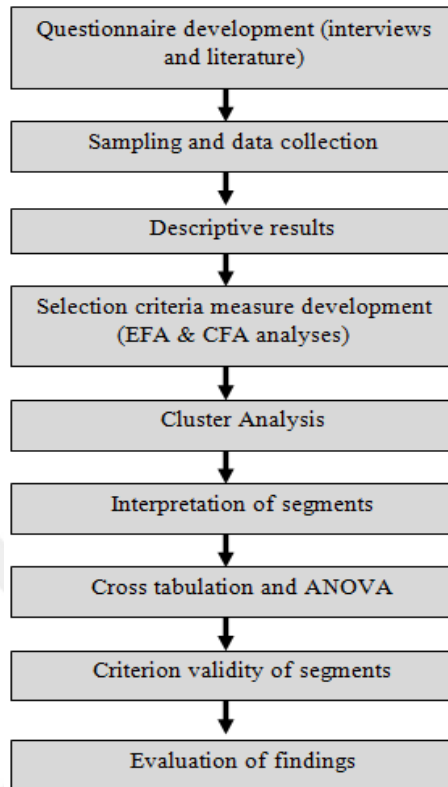
4.2. AN APPLICATION OF MARKET SEGMENTATION IN CONTAINER SHIPPING MARKET IN THE AEGEAN REGION OF TURKEY

Upon elaboration of market segmentation in container shipping through the qualitative study in last section, it is time now to apply market segmentation quantitatively in container shipping. The purpose of this section is to apply post-hoc market segmentation analysis on the customers of container shipping companies, and compare different approaches when segmenting the market.

4.2.1. Methodology

The paper conducts a survey research on container shippers in Aegean Region of Turkey for data collection. As shown in below Figure, the data collected from the survey are used in several analyses (which will be explained in detail later in this section) that include exploratory factor analysis, confirmatory factor analysis, cluster analysis, and ANOVA. The methodology part of this section explains the questionnaire development, sampling and data collection process, and the analysis methods mentioned above.

Figure 14: Quantitative Research Process



Source: Drawn by the author

4.2.1.1. Questionnaire Development

The questionnaire of this dissertation consists of three main sections. The first section attempts to identify the characteristics of the product that exporters ship to overseas. This section can be named as product-related profile of shippers. Yet, it also includes company-specific questions such as number of people working in the company. The next section of survey aims to determine relative importance that shippers attach to container shipping company selection criteria. The final section involves questions to find out position and department of respondents in their companies, experience of respondents, and whether if they have any opinion regarding the research.

The variables in the segmentation framework in the qualitative research of this dissertation form the basis for creating major profiling questions. Some of these

variables are also used as dependent or independent variable. However, some of the sections of qualitative segmentation framework, such as type of customer (shipper or forwarder), are not included in the study. The limitations are explained later in this paper under the sampling and data collection heading. Moreover, the survey contains more profile descriptor questions based on the expert opinions, which are collected to form the survey and to ensure the content validity.

The active questionnaire development process started in the middle of July 2017. The process involved the interviews with industry experts as well as the pilot test. The responses were started to be received on the 23rd of August, 2017. Total twenty-one experts were interviewed. Eight of them were from container lines, five of them were from forwarder companies, five of them were shippers, and three of them were academicians. The interviews took minimum 35 minutes and maximum 95 minutes. The interviews were carried out at the offices of interviewees. None of these interviews were tape-recorded, but instead, detailed notes were taken on the draft survey form. The details of the interviews are given in the Table 19.

Table 19: Details of the Expert Interviewees

Type of organization	Position	Date and interview time
University	Prof Dr.	17 July 2017 (90 minutes)
University	Research Assistant	18 July 2017 (70 minutes)
University	Prof Dr.	18 July 2017 (40 minutes)
Container line A	Region manager & Export sales manager	21 July 2017 (90 minutes)
Container line B	Business development manager & Business development manager	25 July 2017 (75 minutes)
Container line C	Izmir branch manager & Izmir sales manager	26 July 2017 (95 minutes)
Container line D	Sales team manager	27 July 2017 (35 minutes)
Container line E	Operation manager	27 July 2017 (40 minutes)

Table 19 (Continued)

Type of organization	Position	Date and interview time
Forwarder A	General Manager & Sales Manager	1 August 2017 (70 minutes)
Forwarder B	Regional manager & Operation executive	2 August 2017 (80 minutes)
Forwarder C	Sales and operation representative	3 August 2017 (50 minutes)
Shipper A	Export Manager (Canned fruit)	8 August 2017 (45 minutes)
Shipper B	General manager & Export manager (plastic granules)	9 August 2017 (60 minutes)
Shipper C	Export manager (Minerals)	10 August 2017 (40minutes)
Shipper D	Export manager (spice and herbs)	11 August 2017 (40 minutes)

Prior to interviews, possible questions regarding the profile of shippers, selection criteria, and other measures had been created based on the previous literature, qualitative study of this dissertation, and brainstorming. The purpose of each question was explained to the interviewees, and their comments were collected. Accordingly, new questions were added, unnecessary or conflicting questions were deleted, and some questions were improved through better wording. The interviewees were not only asked to assess the content of the questions, but also the wording and number of scale categories.

Upon the creation of final version of the survey, a pilot test was conducted to the shippers. Malhotra and Birks (2007) state that pilot tests are very critical for the success of a survey research as it helps to eliminate or amend problematic questions. The pilot-tests were sent to 5 different shippers in different industries. These shippers are the same as interviewed ones. The time for completing the survey ranged from 5 minutes to 6 minutes. No amendment was required after conducting the pilot test. Since the survey includes all the dependent, independent, and descriptor variables and since it is the only data collection method, the details of the survey items should be clearly explained here.

4.2.1.1.1. Profile questions and segment descriptors

In the survey, we asked respondents to answer the questions considering the product that they export mostly, as one shipper may export different kind of materials, and the expectation and benefits sought by shippers vary based on the product type they export. The reason why we especially focused on product-related questions because in industrial marketing, as Doyle and Saunders (1985) also suggests, the product is more important than the company characteristics. Below is the quotation received from Doyle and Saunders.

“In industrial marketing, benefits sought less depend on the internal psychology or socioeconomic characteristics of buyer and more on the external end use of the product. The buyer needs different products for different purposes, and in specialized industrial markets, will often buy multiple specialist products from different suppliers. For these reasons, it is often more relevant to segment by product benefits rather than customer.”

The interviewees also made comments in parallel to view of Doyle and Saunders (1985). They stated that the personal characteristics of buyers, i.e. socioeconomic status or gender, have little influence on the relative importance attached to the selection criteria. The product characteristics such as the industry or sensitiveness of product, according to the interviews, are probably the most significant affecting factor regarding the benefits sought. This is why the survey requires respondents to answer each question by considering their most frequent export product. The variables in the survey are explained here. These nominal and metric variables are not only used for describing the segments, but also for criterion validity.

Industry of shipper is the first variable in the survey and this item has 10 categories as shown in the Table 20. Instead of adapting a standard industry classification such as Harmonized System Classification, a customized category of industries was built considering the mostly exported items from Aegean Region. Electronics is one of the mostly exported products from this region. Yet, the number

exporters are very limited that there is no need for segmenting them. These electronic customers are usually under the category of “key account” in container lines. Thus, no category was specifically built for electronic exporters. Similarly, block marble and processed marble are exported at large amounts, but the number of exporters are vast in these categories. The interviewees stated that block marble and processed marble (tiles) are two distinct products in terms of sensitivity, hence they should be in different categories.

Table 20: Sub-Categories of Industry of Shippers

Industry category	The goods falling into this category
Minerals & Stones	Block marble, feldspar, quartz, boron, chrome, etc.
Tiles & Ceramics	Various tiles and processed marbles or granite
Machinery	Industrial machinery, agricultural machinery, heaters, boilers, etc.
Refrigerated food	Dairy products, fresh vegetables and fruits, poultry products, seafood etc.
Food	All dried foods, spices and herbs, olive oil, dried fruits, tomato paste, beverages.
Spare parts	Automotive spare parts, spare parts of machinery and other industries, bearings etc.
Apparel products	Garment and underwear, shoes, bags, towels etc.
Textile products	Cloth, yarn, fibers etc.
Chemicals	Polymer products, cleaning products, chemical raw materials.
Others	Respondents are required to indicate

When creating the categories of the industry of shippers, first, Aegean Exporters’ Unions were contemplated as the category of industry. However, since some products, such as machinery and spare parts, are not represented by a union but exported by significant amounts, list of unions were eliminated as a category of shippers’ industry type. Besides, some of the unions are separate, e.g. olive oil exporters, dried fruit exporters, forest product exporters (which include herbs such as laurel leaves and oregano), but they all actually fall into the category of “foods” in the eye of a container shipping company. Instead of the unions list, we investigated the statistics of Sea Transporters Association (Deniz Nakliyeciler Derneği), which

illustrated all shipments from the ports in Izmir, including cargo type and destination port. We detected most frequently shipped cargoes and evaluated these cargoes with the interviewees. Then, these cargoes were classified under the categories as illustrated in above table.

Description of cargo is the second item of the survey. Respondents were asked to describe their leading export cargo such as what the product is, if it is a packed product or not, and what the commercial description of cargo. This has helped us to build further classification of cargoes in addition to above question. By considering the each cargo description, we manually created new industry classification based on Industry Classification Benchmark (ICB), which was developed by Dow Jones.

Destination region is the third item of the survey. Respondents were asked to choose the destination region where they ship their cargoes mostly. The region categories were created based on the shipment frequencies on Sea Transporters Association as well as the judgments of the interviewees. The categories are North Europe, South and East Europe, Far East and Asia, North America, East Mediterranean, Middle East, North Africa, Middle and South America, and East and West Africa. This will be used to profile the segments discovered and to find out if shippers' expectations differ significantly based on the destination region.

Rate of seaway transportation among total transportation was also asked to respondents. This question had three categories as all seaway, mostly seaway, and rarely seaway. Another item was the *container type* (dry, reefer, open top, or flat-rack) that shippers use when shipping their mostly carried cargo. *Container size* (20' or 40') of exporters' shipments was included in the survey. The respondents were asked if their cargo is under the category of dangerous goods. We also asked if the exporter directly works with a container line, work through a forwarder, or sometimes through a forwarder and sometimes directly with container line.

Monthly container volume of shippers was asked as a measure of size of customer, which is a significant variable for the profitable customer relations. This item consists of 5 difference categories as 1-5, 6-14, 15-39, 40-99, and 100 and more. These ranges are created based on the judgment of interviewees in the industry. Additionally, we also asked the *number of employee* with four categories based on

the classification of Turkstats as 1-9, 10-49, 50-249, and 250 and more. We asked *cargo value per container* with three categories as 0-14.999USD, 15.000-44.999USD, 45.000USD and more. These categories are calculated considering value of export goods per kg and the comments of interviewees. In the beginning this item was designed to be an open-ended question. However, interviewees indicated that respondents may consider this question somehow confidential information and may prefer not answering the question or even cancel responding the survey. As a result, we asked cargo value in categories by which respondent can feel better to answer.

Cargo sensitivity is one of the two metric descriptors in our questionnaire. Since the expectation of shippers may differ based on the sensitivity of their products, i.e. more sensitive products tend to be more sensitive to transit time, sensitivity of cargo is necessary to ask. However, the sensitivity of a product is not a single dimension. One cargo can be very sensitive to moisture or wetness in the container but insensitive to smell. The interviewees indicated that a cargo can be sensitive to dirtiness, scent, and moisture in a container. It is not reasonable to classify the cargoes binary as sensitive and non-sensitive. Instead, as the interviewees also suggested, sensitiveness is a relative concept, and we should measure the relative degree of sensitiveness that shippers think. As a result, we developed a five-point scale as 1= non-sensitive / 5= very sensitive.

Competitive environment of shippers is crucial as behavior and strategy of decision makers is highly influenced by their perception on how competitive their market (Panagiotou, 2006; Zahra & Bogner, 2000). For instance, Menon et al. (1998) studies third party logistics service provider selection and indicated that hostility of environment significantly influences the relative importance on the criteria for respondents. Fynes et al. (2005) applied a structural equation modeling for measuring supply chain relation quality and found that perceived competitive intensity significantly affects the relationship between supply chain relation quality and performance. Slater and Narver (1994) found that competitive environment moderates the relationship between market orientation and performance. Since cognitions regarding competitive environment are influential in behavior of decision makers, the perception of competitive environment may affect the shippers' degree

of importance on. Thus, we have developed a three-item scale for measuring perceived competitive environment of shippers (1=Totally disagree, 5=Totally agree).

Table 21: Items of Competitive Environment Measure

Variable	Abbreviation	Adapted from
Competition in our industry is cut-throat	Competition1	(Fynes et al., 2005)
The number of competitors is high in our industry	Competition2	(Salavou et al. 2004; Slater and Narver, 1994; Zahra and Bogner, 2000)
Competitors in this market pursue aggressive policy by price reductions	Competition3	(Fynes et al., 2005; Slater and Narver, 1994; Zahra and Bogner, 2000)

Source: Drawn by the author

Delivery terms of shippers are also asked to shippers. First, shippers are asked to select the delivery terms that consists of three sections: FOB&FAS, CFR&CIF, and DAP&DDP (the only EXW senders are eliminated from the analysis). Then, shippers are asked their most frequent delivery term when exporting their cargoes. Delivery term is important because it tells us to what extent shipper is responsible of total transportation process. This could be an important profiling item that can provide important implications about the segments and selection criteria of shippers.

As the last profile questions, we asked if the company has a separate logistics department or not and if the company has a systematic written purchasing procedure or not. Respondents were also asked about their experience and position in the company to assess if they are the right people to answer the survey.

4.2.1.1.2. Selection Criteria

The selection criteria are used in this study to reveal benefits sought by shippers when they purchase shipping service from container shipping companies. Selection criteria are used by many B2B studies in literature to reveal benefits of customers (Lynn, 1986; Murphy & Daley, 1994; Shahrabi et al., 2009; Thomas,

2016; Wen & Lin, 2015). Initial to creating selection criteria, the selection criteria and service attributes studies in container shipping – which had already been discussed in previous chapters – were investigated (Brooks, 1990; Collison, 1984; Durvasula et al., 2000; Kannan et al., 2011; Lu, 2003; Thai, 2008; Tuna and Silan, 2002; Wong et al., 2008). The most frequently used variables were detected.

Table 22: Selection Criteria Variables

Variable	Abbreviation	Source*
1. Short transit time	Transit	(Brooks, 1990; Collison, 1984; Durvasula et al., 2000; C. S. Lu, 2003; Tuna & Silan, 2002; Wong et al., 2008)
2. Directness of sailing	Directness	(Brooks, 1990; V Kannan et al., 2011)
3. Damage-free transportation	Damage-free	(Brooks, 1990; Collison, 1984; C. S. Lu, 2003; Tuna & Silan, 2002)
4. Low freight rates	Freight	(Brooks, 1990; Durvasula et al., 2000; Wong et al., 2011)
5. Flexibility in payment	Flexinpayment	(V Kannan et al., 2011)
6. Willing to negotiate freight rate	Negotiation	(Collison, 1984; C. S. Lu, 2003; Wong et al., 2008)
7. Low local port fees of carrier	Localcost	Interviews
8. Fast documentation	Fastdoc	(Durvasula et al., 2000; V Kannan et al., 2011)
9. Error-free documentation	Errorfreedoc	(C. S. Lu, 2003; Thai, 2008; Tuna & Silan, 2002)
10. Quick response to inquiries	Quickresponse	(Brooks, 1990; Lu, 2003; Thai, 2008; Tuna and Silan, 2002; Wong et al., 2008)
11. Effectiveness of online tracking	Tracking	(Brooks, 1990; Kannan et al., 2011; Lu, 2003; Thai, 2008)
12. Availability of empty containers	Emptycont	(Kannan et al., 2011)
13. Sailing on promised time	Ontimesailing	(Kannan et al., 2011; Lu, 2003, Tuna and Silan, 2002; Wong et al., 2008)
14. Accessibility of line personnel	Accessibility	Interviews
15. Wide global network of carrier	Network	(Durvasula et al., 2000)
16. Ability of carrier to offer effective door-to-door shipment	D2D	Collison, 1984; Lu, 2003; Wong et al., 2008)
17. Availability of warehouse service	Warehouse	(Collison, 1984; Lu, 2003)
18. Availability of compatible EDI	EDI	(Lu, 2003; Thai, 2008)
19. Customized performance reporting	Reporting	Interviews

Table 22 (Continued)

Variable	Abbreviation	Source*
20. Frequency of visiting by carrier personnel	Visiting	(Lu, 2003)
21. Strong personal relation with carrier personnel	Relations	(Durvasula et al., 2000)
22. Consultancy given by carrier when necessary	Consultancy	Interviews
23. Long demurrage free-time period	Freetime	(Kannan et al., 2011)
24. Cleanliness of containers	Clean	(Collison, 1984; Kannan et al., 2011; Lu, 2003; Tuna and Silan, 2002)
25. Reputation of the carrier in market	Reputation	(Brooks, 1990; Durvasula et al., 2000, Kannan et al., 2011)

*The wordings in the original source might be different but the content and meaning are same or similar

Upon creation of the list of most frequent variables, the opinions of interviewees were received. Some of the most frequent variables used in the literature were deleted based on the suggestion of interviewees. For instance, custom clearance is one of the variables used in the literature (Kannan et al., 2011; Lu, 2003). However, the interviewees stated that container lines do not perform this service in Turkey, so this item was removed.

Another issue is the scale category chosen for the selection criteria in the survey. In the literature review, it is observed that segmentation studies utilize different number of scale categories ranging (5, 6, 7 and 10). The selection criteria in the survey were decided to be asked as seven-point scale. When coming to this decision, several issues were considered. First, since the purpose of the survey study is to segment the respondents based on their reactions to selection criteria, a variance among the respondents should be achieved. Based on our experience in previous researches (Balci et al., 2018) and comments of the interviewees, we contemplated that a five-point scale questionnaire would not create a wide range of variance, which, in the end, would not produce distinct segments. This argument is also supported in the study of Chen et al. (2017), who used nine-point scale when segmenting container shipping market through the analysis of relation between container shipping service attributes and customer retention. The authors in that study argued that shorter intervals may be limited to discriminate comparing to longer intervals. On the other hand, very large scale-points may be complicated for

respondents to comprehend the differences between each point. Generally, 7±2 point scales are considered to be optimal in terms of easiness for respondents to answer as well as the reliability and validity issues (Cox III, 1980). The scales between seven and ten are found to be best in terms of reliability, validity, discriminating power, and respondent preferences (Preston and Colman, 2000). Hair et al. (2008) also stated that there is no certain rule regarding the number of scale points in marketing research, yet 7 or 10 point scales are very effective especially with educated people. Taking these issues into account, seven-point scale was chosen.

Another important issue with selection criteria is the wording used in the scale. We asked shippers how important they think each selection criterion. In other words, we asked them to specify degree of importance of each criterion. In the seven-point scale of selection criteria, 1=very low importance while 7=very high importance. These wordings were used by Köseoğlu (2014) in his PhD thesis. These wordings were also asked to interviewees. The scholars at university agreed that the wordings were clear and effective to measure the degree of importance of selection criteria.

4.2.1.2. Sampling and Data Collection

The qualitative study in previous section suggests that segmentation analysis should be port-specific because of the variety of shippers in terms of cargo characteristics and expectations. Besides, the resources and strategies of container shipping companies vary for each port or hinterland. This survey study investigates the shippers located in the hinterland of ports in Izmir (Port of Izmir Alsancak and private container terminals in Nemrut Bay in Izmir). Although some shippers outside of Aegean Region may export or import their cargoes, we have limited the survey research with only shippers located in Aegean Region of Turkey.

Another limitation of our survey population is about the customer type. The theoretical segmentation model suggests that freight forwarders and shippers are the two kinds of customers in the eye of a container line. Yet, the ultimate customers are shippers, and although freight forwarders act as shippers in the bill of lading, they can also be considered as a kind of intermediaries. Focusing on shippers for

segmenting the market can also generate insightful implications for freight forwarders as shippers are also their customers. A future study may segment the freight forwarders. Shippers are also divided into two as exporters and importers. Since majority of marketing facilities are targeted to exporters in the region, which has also traditionally been an exporting area rather than importing, the survey study is limited to exporters in the Aegean Region.

Based on the discussion of limitations above and the purpose of this study, the population is decided as the exporter list of Aegean Exporters' Union. By the time we received the list, the number of exporters was 6.330. However, the list had some drawbacks. The first drawback was the duplication of company names. These duplications have been removed. There were also many individual names shown as exporters and companies without any website or professional e-mail domain in their own company name (i.e. they use Hotmail, yahoo, or mynet). The original list also included some exporters outside of Aegean Region. We have limited our study with only exporters located in Aegean Region. Upon deletion of these exporters from the list, our population is decreased to 3.951. The list includes the full name, address, city, phone number, website, e-mail addresses of the companies.

It should be noted that this dissertation focuses on exporters who uses sea transportation, even if it is rare. Otherwise, the respondents would not be the right people for answering questions of the survey. However, by just looking at the list, it is not possible to know if an exporter in the list, or in other sources, chooses seaway or not for his/her export. Some of the exporters prefer only road or air transportation and never use seaway. After starting to send our online survey form, we have received some e-mails, especially from fashion industry, that they are not able to answer the survey as they do not use seaway for their export.

Besides, since B2B markets are more complicated and several people may involve in the decision making (McNeil, 2005), it is also very critical to ask the survey questions to right people in the company. The respondents must be from export department or purchase department of exporting companies. Considering the unclearness of seaway usage situation and the necessity to reach the right person in the company, judgmental sampling method is used. Judgmental sampling is useful to

ensure that the respondents are the right people about the subject investigated and capable of answering the questions correctly (Sarstedt and Mooi, 2014).

Although the respondents are selected by judgmental sampling, a quota sampling is also utilized in the sampling of survey study. Aim of quota sampling is defined by Bryman (2012: p.203) as “*to produce a sample that reflects a population in terms of the relative proportions of people in different categories*”. The industry categories (described in previous section) of each shipper is inserted to the exporter list. The levels of each category is determined by the cargo statistics of Sea Transporters Association in Izmir. Relative proportions of industry categories in the population are achieved.

As suggested Sarstedt and Mooi (2014), the characteristics of the respondents were also asked to three industry experts (1 freight forwarder and two container lines) to assess if the characteristics of sample represent the characteristics of exporters in Aegean Region. The experts agreed that the sample represents the characteristics of population in terms of frequencies of industries, destinations, and monthly container volumes (i.e. majority of the destinations are Europe, Middle East and North America, majority of products are from food industry and minerals and tiles, and majority of the companies are small sized in terms of container volumes per month). The detail of sample characteristics will be given later under descriptive results.

The data is collected by self-completion online questionnaire (Google Forms). The survey is sent to the attention of export or logistics department person in charges. The usage of online form has enabled us to receive the responses more conveniently and faster, and organize the data easily through online excel sheet. A total of 356 usable responses have been received at the end of data collection process.

4.2.1.3. Analysis methods

This section explains the details of basic analysis methods employed for segmenting the exporters located in Aegean Region of Turkey. Although the segmentation process includes basic statistics such as ANOVA and Chi-Square, this

section rather focuses on explaining Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), and Cluster Analysis. The types and function of cluster analysis have already been briefly explained under Chapter 3. This section attempts to describe the details of these analyses specific to empirical application in this dissertation.

This study first reveals the constructs of container line selection criteria through exploratory factor analysis and confirmatory factor analysis. The process is named as measure development. Upon achieving reliable and valid factors of selection criteria through measure development, factor scores are used in cluster analysis. Afterwards, the segments are profiled by means of contingency tables with the nominal variables in the survey, and tested to see if segments show significant differences in terms profiling variables. Contingency tables are of significant importance because it ensures that segments are accessible, which is a crucial requirements of market segmentation (Kotler and Keller, 2012). ANOVA analysis is also carried out to check if segments have distinct needs and wants, in other words, to check if importance level of selection criteria shows significant differences among the segments.

The effectiveness and solidness of above procedure are well documented and applied in the previous literature of market segmentation, both in industrial context (Merrilees et al., 1999; Mitchell, 1998; Sharma and Lambert, 1994; Terho and Halinen, 2012) and in consumer context (Fürst, 2014; Haustein and Møller, 2016; Prillwitz and Barr, 2011; Shiftan et al., 2008). However, the procedure has not been applied within the container shipping context so far. In addition to this process, as suggested by (Hair et al., 2014; Sarstedt and Mooi, 2014), this dissertation also attempts to ensure criterion validity of segment through the measures that are not used for segmenting the market.

For the sake of easiness in following the flow of research, the details of how we employed the analysis methods are given as follows.

4.2.2. Findings of the Study

In the findings part of study, we will present descriptive results, exploratory and confirmatory factor analyses, and cluster analysis.

4.2.2.1. Descriptive results

This section includes profile of respondents and characteristics of companies in terms of their products, industries, size, and purchase patterns. Overall scores on selection criteria and other metric variables are presented after measure development in the next section.

Approximately 19% of the respondents are either general manager, CEO, or the owner of the company. 34% of the respondents are export, foreign trade, and logistics managers. Around 35% of them are export or logistics specialists while 10% of respondents are purchase responsible. Experience level of the respondents is quite satisfactory that only less than 15% of respondents have between 1-3 years of experience in their positions. Almost 50% of the respondents have more than 10 years of experience.

Table 23: Profile of Respondents

<u>Position of respondents</u>			<u>Experience of respondents</u>		
Position	Frequency	Percent	Experience	Frequency	Percent
General Manager & partner	68	19,1%	1-3	53	14,9%
Export & Logistics Manager	124	34,8%	4-9	134	37,6%
Export & Logistics Specialist	126	35,4%	10-15	102	28,7%
Purchase Responsible	38	10,7%	16 +	67	18,8%
Total	356	100%	Total	356	100%

The industrial classification of respondent companies is presented in two ways: First is the classification developed by the author based on the expert opinions and regional trade statistics, and second is the three product related industries of Industry Classification Benchmark (ICB). According to the results shown in Table 24, the largest category in industry of companies belongs to dry food section with almost 20% of total population. This is quite similar to population in reality as Aegean Region has traditionally been an export area for food exporters. It is followed by mineral exporters, tiles and ceramic producers, spare part exporters, and

chemicals and plastics producers. The smallest categories are fashion and textile companies with each around 5% of population.

Table 24: Industry Classification of Respondent Companies

Industry of companies	Frequency	Percent
Minerals	48	13,5%
Tiles & Ceramics	39	11,0%
Machine	37	10,4%
Refrigerated food	30	8,4%
Dry food	71	19,9%
Spare part	35	9,8%
Fashion	18	5,1%
Textile	16	4,5%
Chemicals & plastics	34	9,6%
Others	28	7,9%
Total	356	100,0%

Considering the ICB classification of respondent companies' products, around 25% of them are basic materials, 33% of them are industrial goods, and 41% are consumer products. Approximately 25% of the products have low cargo value per container while 55% of them have medium values and over 20% of the cargoes have high value per container.

Table 25: ICB Classification of Products and Cargo Value per Container

ICB Category of products			Cargo value per container		
ICB Category	Frequency	Percent	Cargo value	Frequency	Percent
Basic Materials	91	25,6%	Low	86	24,2%
Industrials	118	33,1%	Medium	196	55,1%
Consumer	147	41,3%	High	74	20,8%
Total	356	100%	Total	356	100%

The size of the company is considered in two ways: Average monthly container of a company and number of employees at a company. As shown in Table 26, large amount of the companies falls into the category of 1-5 containers per month, which is followed by 6-14 containers per month category. These two groups

constitute 38% and 28% of the population respectively. The smallest groups are 40-99 containers and 100 and more containers categories (8.7% and 8.1% respectively). Almost 17% of the population in our survey ships between 15-39 containers per month. Regarding the number of employee, almost 40% of the companies have employee between 50-249 while around 16% of companies have employee between 1-9 people and 250 and more people.

Table 26: Monthly Container Volume and No of Employee of Respondent Companies

<u>Monthly container volume</u>			<u>No of employee of companies</u>		
Monthly container volume	Frequency	Percent	No of employee	Frequency	Percent
1-5	137	38,5%	1-9	55	15,4%
6-14	100	28,1%	9-49	105	29,5%
15-39	59	16,6%	50-249	139	39,0%
40-99	31	8,7%	250 and more	57	16,0%
100 and more	29	8,1%	Total	356	100%
Total	356	100%			

More than 50% of respondents stated that they work with both directly container lines or through forwarders. Around 27% of respondents indicated that they only work through a forwarder when purchasing container shipping service while almost 17% percent of them only work directly with a container line. On the other hand, we asked respondents their most preferred terms (they may also ship with other delivery terms). 50% of the respondents stated that their most preferred delivery term is FOB&FAS while around 28% of them mostly prefer CFR&CIF, and 21% of them mostly prefer DAP&DDP.

Table 27: Purchase Behavior and Preferred Delivery Term of Respondents

<u>Purchase behavior</u>			<u>Most preferred delivery terms</u>		
Working with	Frequency	Percent	Delivery terms	Frequency	Percent
Only lines	59	16,6%	FOB&FAS	181	50,8%
Only forwarders	97	27,2%	CFR&CIF	99	27,8%
Both lines and forwarders	200	56,2%	DAP&DDP	76	21,3%
Total	356	100%			100%

How often a company prefers sea transportation is also an important issue to consider. 46% of the companies indicated that they only use seaway transportation for their export while 38% of them stated that they mostly use seaway transport. On the other hand, around 15% of the respondents prefer seaway transportation rarely. We also asked the container type they use for their mostly exported cargo. Almost 80% of the companies use dry container while 20% of them use reefer or special containers such as flat-rack and open-top. The number of reefer usage is 45, which means that 15 of the dry food exporters use reefer containers in addition to those frozen or cold food exporters.

Table 28: Seaway Usage Frequency and Container Type Frequency

Seaway Usage	<u>Seaway Frequency</u>		Type	<u>Container Type</u>	
	Frequency	Percent		Frequency	Percent
All	165	46,3%	Dry	281	78,9%
Mostly	138	38,8%	Reefer	45	12,6%
Rarely	53	14,9%	Special	30	8,4%
Total	356	100%			100%

Considering the destination region, we asked respondents to choose most frequent destination region they export their most frequent export cargo. The busiest destination is North Europe with percentage of 25. It is followed by Middle East and North America with each has 16 percent of share. Far East & Asia is the fourth busiest destination among the respondent companies.

Table 29: Most Frequent Destinations of Shippers

Destination	Frequency	Percent
North Europe	90	25,3%
South&East Europe	29	8,1%
Far East & Asia	50	14,0%
North America	58	16,3%
East Med.	27	7,6%
Middle East	57	16,0%
North Africa	22	6,2%
Others	23	6,55
Total	356	100,0%

4.2.2.2. Measure Development: Exploratory and Confirmatory Factor Analyses Results

This section deals with the measurement development through exploratory and confirmatory factor analyses. First, the factors that summarize the selection criteria and criterion validity measures are extracted. Then, confirmatory factor analysis is conducted to ensure reliability and validity of the factors extracted. A measure development process may require multiple running of EFA and CFA analyses until revealing the best option for the constructs.

Exploratory factor analysis is an interdependence multivariate analysis that reduces large number of observed variables into small number of latent variables. Several important issues and steps exist when conducting and reporting EFA. The first issue is the adequacy of sample for applying factor analysis. The number of adequate sample is a critical issue in EFA. The larger sample sizes usually tend to result in better outcomes (Costello and Osborne, 2005). The ideal ratio of minimum respondent number per variable in literature varies between 5 and 10. Since respondent number is 356 and number of variables is 25 in selection criteria, our factor analysis is not supposed to have sample issues. Another measure we check is Kaiser-Meyer-Olkin (KMO) sampling adequacy test, which is used to test appropriateness of factor analysis and should be between 0,5 and 1 (Malhotra & Birks, 2007). The KMO value of the final factor solution of this survey is 0,856, which is quite satisfactory. Besides, Bartlett's Test should also be significant to ensure that conducting factor analysis is appropriate for the data.

Table 30: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,856
Bartlett's Test of Sphericity	Approx. Chi-Square	4035,466
	Df	210
	Sig.	,000

Hair et al. (2014) state that there are two basic extraction methods: component analysis and common factor. Since our primary goal is data reduction as Hair et al. (2014) suggests, and majority of previous segmentation studies and container shipping studies prefer, principal component method is chosen in this study. Nonetheless, it is also important to report that common factor analysis alternatives were applied in our study (principal axis factoring, maximum likelihood etc.) and they produced the same factor results with principal component analysis. Eigenvalues greater than 1 is chosen to determine how many factors to achieve.

Rotation of factors simplifies the interpretation of factor matrix. In this study, Varimax rotation is chosen, which is the most commonly used rotation method in marketing researches (Malhotra and Birks, 2007). To decide deletion of a variable, two common methods are used: If a variable has high cross-loadings on more than 1 factor, and if factor loading of a variable is too low for any of the factors (Hair et al., 2014). Factor loadings over 0,4 are not displayed to provide easiness in reading. Loadings over 0,4 are also considered significant as suggested by Hair et al. (2014). Accordingly, “damage-free transportation performance” is eliminated because of the low factor loading (0,368) and “reputation of carrier in the market” is deleted because it has significant cross-loadings on more than a single factor. The initial version of factor analysis can be seen below.

Table 31: Initial Rotated Component Matrix

	Rotated Component Matrix ^a				
	Component				
	1	2	3	4	5
Reporting	,830				
Tracking	,825				
Warehousing	,797				
D2D	,744				
Network	,738				
EDI	,710				
Freetime	,536				
Quickresponse		,793			
Errorfreedoc		,776			
Fastdoc		,731			
Accessibility		,657			
Ontimesailing		,637			
Emptycont		,547			
Reputation	,416	,501			

Table 31 (Continued)

	1	2	3	4	5
Negotiation			,891		
Flexinpayment			,879		
Freight			,813		
Localcosts			,767		
Transit				,810	
Directness				,756	
Clean				,687	
Relations					,760
Visiting					,693
Consulting					,636

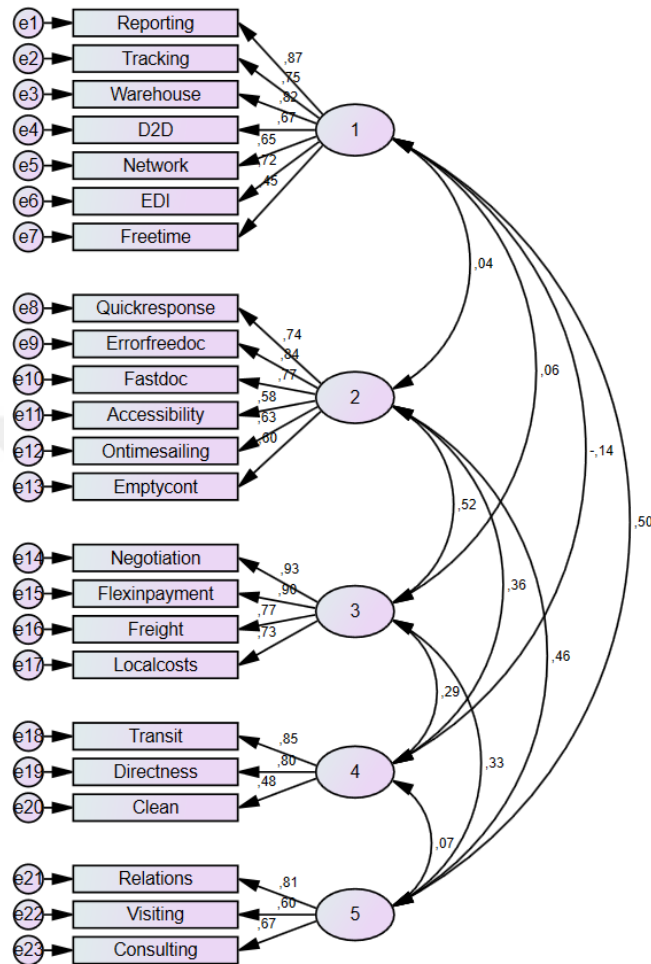
Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

The measure development process continues through confirmatory factor analysis. CFA is conducted to ensure reliability and validity of the factors derived from EFA, and to check if the model is fit. If, reliability, validity, and model fit are not achieved successfully, then deletion of some problematic variable might be necessary. The standardized factor loadings should be 0,5 or higher according to Hair et al. (2014). Hence, “freetime” and “clean” are removed from the measure. The second factor (which will be named as “Responsiveness”) had a convergent validity issue. Average variance extracted (AVE) was lower than the minimum acceptable level of 0.50 (Fornell & Larcker, 1981). According to suggestion of Fornell and Larcker (1981), AVE issues may arise from an observed variable that has high cross-loadings on more than a factor. We re-evaluated the EFA by displaying factor loadings over 0,3 and detected that “emptycont” had cross loadings (0,36) with the fourth factor. This criterion was also deleted.

Figure 15: Illustration of Initial CFA for Selection Criteria



Upon deciding on deletion of these three variables based on CFA, EFA is required to be run again. The current version of EFA (after deletion of total five variables) has no cross loadings or low factor loading. All the factors have loadings above 0.5. Total variance explained by the factor solution was 70.6%. CFA is carried out again to check model fit, reliability, and validity of factors. The final CFA indicates a solid model fit, and all factors are reliable and valid.

Table 32: Final Rotated Component Matrix

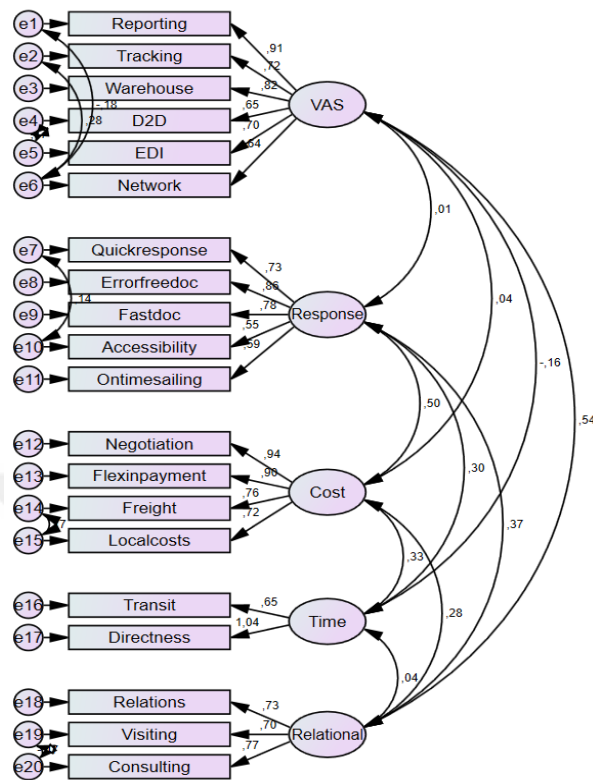
Rotated Component Matrix^a					
	Component				
	1	2	3	4	5
Reporting	,852				
Tracking	,795				
Warehouse	,787				
D2D	,782				
EDI	,748				
Network	,723				
Quickresponse		,807			
Errorfreedoc		,797			
Fastdoc		,754			
Accessibility		,679			
Ontimesailing		,640			
Negotiation			,893		
Flexinpayment			,884		
Freight			,824		
Localcosts			,781		
Transit				,856	
Directness				,851	
Relations					,815
Visiting					,715
Consulting					,651

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

Figure 16: Illustration of Final CFA for Selection Criteria



Reliability of the factors in this study is measured in two ways: Cronbach's Alpha value and composite reliability. Cronbach's Alpha and composite reliability (CR) scores are considered adequate between 0.6-0.7, and better if they exceed the level of 0.7 (Bagozzi and Yi, 1988). As shown in Table 33, alpha and composite reliability values of all constructs well exceed the level of 0.7. Convergent validity is defined by Malhotra and Birks (2007, p.359) as *"the extent to which the scale correlates positively with other measurements of the same"* while discriminant validity is defined as *"the extent to which a measure does not correlate with other constructs from which it is supposed to differ"*. Convergent validity of each construct is measured by average variance extracted (AVE), while discriminant validity of the construct is measured by checking maximum shared variance (MSV). AVE value should be higher than 0.5 and MSV should be less than AVE value (Hair et al., 2014; Tarhini et al., 2016). Table 33 demonstrates that these validity issues are satisfied in our measure.

Table 33: Reliability and Validity Values of Selection Criteria Factors

Factor	% of variance	Alpha	CR	AVE	MSV
Value added services (VAS)	19.5%	0,88	0,88	0,56	0,29
Responsiveness	15.8%	0,82	0,83	0,51	0,25
Cost	15.7%	0,90	0,90	0,70	0,25
Time	10.0%	0,81	0,85	0,76	0,11
Relational	9.6%	0,72	0,78	0,54	0,29

Fit Indices: CMIN/DF= 3.00 (462.0/154), CFI=0.92, TLI=0.90, RMSEA=0.075, SRMR= 0,071

In addition to reliability and validity of the constructs, goodness of fit indices of CFA model is also evaluated. Numerous goodness of fit indices exist to check if model of CFA is fit. Hair et al. (2014) classifies the fit indices into three as absolute fit indices, incremental fit indices, and parsimony fit indices. One of the basic absolute fit indices is CMIN/DF (Chi-square) and if it is lower than 5.00, then it is considered that model is fit (Kline, 2016). CMIN/DF score of our model is 3.00, which is acceptable. However, since the CMIN/DF score is very sensitive to sample size, other indices are also checked. One of them is Root Mean Square Error of Approximation (RMSEA). Hair et al. (2014) stated the cutoff value of RMSEA as between 0.03 – 0.08. RMSEA score 0.075, which falls into the range of cutoff value.

Brown (2015) indicated Tucker Lewis Index (TLI) and Comparative Fit Index (CFI) as commonly recognized comparative indices. TLI and CFI scores range between 0 and 1, and it is better the score is closer to 1. Hair et al. (2014) indicates that scores above 0.90 demonstrate a good model fit. Our TLI and CFI scores are 0.90 and 0.92 respectively. Standardized Root Mean Residual (SRMR) score (0.071) of the results also indicate that the model is as it is lower than the cutoff value of 0.08 (Hu and Bentler, 1999).

Upon ensuring reliability, validity, and model fit of selection criteria constructs, it is now time to explain each of them.

Value added services (VAS) consist of six items as can be seen in the final component matrix table above. The reason why this factor is named as VAS because the items are not the core services of a container line and these items are usually

considered as extra services or value adding services. Performance reporting, effectiveness of container tracking system, warehousing services, effectiveness of D2D transport systems, EDI system, and wide global network are all value adding services and are not required by all customers. Reliability and validity scores of this factor are quite satisfactory.

Responsiveness factor includes five items. These five items, in order of factor loading scores, are quick response to inquiries, error-free documentation, fast documentation, accessibility of line personnel when needed, and timeliness of sailings. This factor represents the ability of a container line to respond all inquiries on time and accurately and to be punctual in all services. This factor exceeds the requirements of reliability and validity scores.

Cost factor involves total four items: Willingness to negotiate freight rates, flexibility in payment, low freight rates, and low local port fees. Cost of a shipping service not only consists of freight rate but also how a shipping line is willing to negotiate and how flexible the line behaves in payment e.g. deferred payments. Although local port cost of shipping lines do not change much, local cost of some container lines might be higher than others, and it also becomes the member of cost factor. This factor has the highest reliability scores and its validity scores are very high.

Time factor has two items: Short transit time and directness of sailing. This factor is different than responsiveness because it measures how short a sailing time of a container line for a destination. Although this factor consists of two items, reliability and validity scores are quite satisfactory.

Relational factor includes three items: Strong personal relation with container line personnel, frequency of visiting by line personnel, and consultancy given by line personnel when necessary. This factor also satisfies reliability and validity requirements.

According to the overall means of factors, the most important one is responsiveness followed by cost and time, all of which have score above 6. Relational is the fourth important factor with overall mean of 5.20 and value added services is the least important one based on overall means.

Table 34: Overall Means of Selection Criteria Factors

Factor	Mean (1-7 Scale)
Responsiveness	6.58
Cost	6.27
Time	6.25
Relational	5.20
Value added services (VAS)	4.78

Profiling and Criterion Validity Factors

The procedure for determining selection criteria factors is also applied for other constructs in the survey, which will be used for describing segments and ensuring criterion validity (perceived competitive environment of shippers and product sensitivity of shippers). The two factors explain 73% of the total variance. Factor loadings of all variables in EFA are high.

Table 35: KMO and Bartlett's Test for Profiling and Criterion Validity Constructs

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,734
Bartlett's Test of Sphericity	Approx. Chi-Square	1280,772
	df	15
	Sig.	,000

Table 36: Rotated Component Matrix of Criterion Validity Factors

Rotated Component Matrix		
	1	2
Sens_dirtiness	,945	
Sens_smell	,940	
Sens_wet	,939	
competition1		,889
competition2		,863
competition3		,681

CFA also indicates that model is satisfactory in terms of fit indices and reliability and validity scores. All standardized factor loadings of each factor are higher than 0.5. As shown Table 37, Cronbach' alpha and composite reliability scores of each factor are above the suggested cutoff value of 0.7, which indicates that the factors are reliable. All AVE values are above 0.5, which demonstrates that convergent validity is assured. Discriminant validity is also ensured because MSV values of each factor are lower than AVE. Goodness-of-fit indices also prove that the CFA model is fit (CMIN/DF= 2.50, CFI= 0.99, TLI=0.98, RMSEA= 0.065, SRMR= 0.044).

Figure 17: CFA Illustration of Criterion Validity Factors

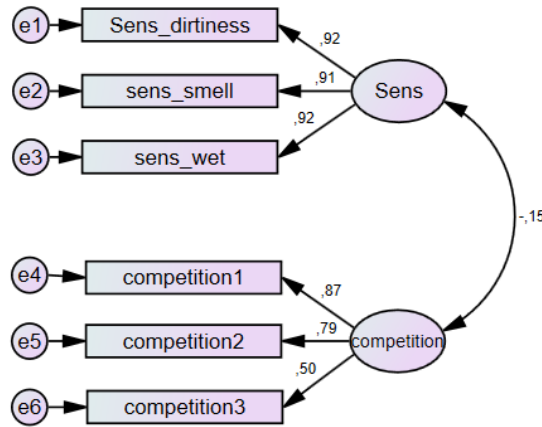


Table 37: Reliability and Validity Details of Validity Factors

Factor	% of variance	Alpha	CR	AVE	MSV
Cargo sensitiveness	47.6%	0,94	0,94	0,84	0,01
Perceived competitive environment	30.9%	0,75	0,77	0,54	0,02
CMIN/DF= 2.50, CFI= 0.99, TLI=0.98, RMSEA= 0.065, SRMR= 0.044					

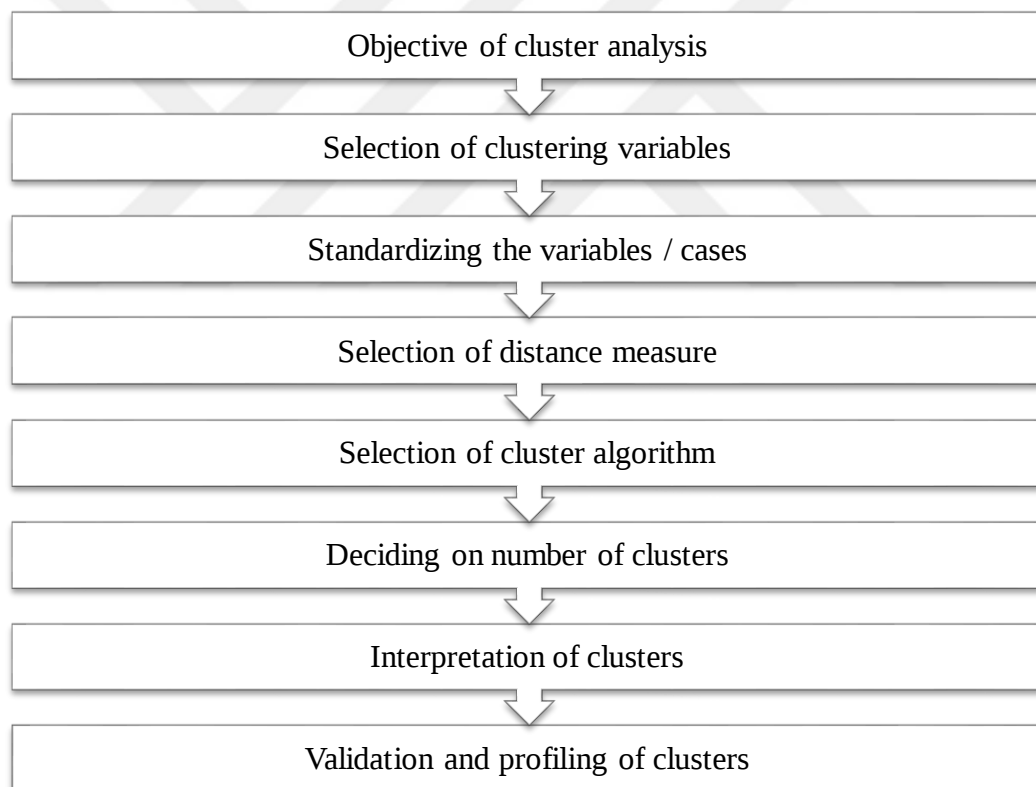
4.2.2.3. Cluster Analysis

The main purpose of cluster analysis is to classify observations or objects in an optimal way that members in a group should be similar but groups should be

dissimilar (Rencher, 2002). At first glance, cluster analysis seems similar to factor analysis but it is different in two ways. First, cluster analysis classifies objects while factor analysis groups variables. Second, cluster analysis utilizes proximity while factor analysis considers the correlation for grouping (Hair et al., 2014). Two objects are considered as close or similar when distance between the two objects is small.

Cluster analysis is a multi-step process that a researcher should make decisions regarding several considerations. This dissertation adapts the clustering processes of Hair et al. (2014, p. 426-438). Accordingly, Figure 18 is created to illustrate the each step of our cluster analysis.

Figure 18: Cluster Analysis Process



Source: Adapted from Hair et al. (2014)

4.2.2.3.1 Objective of Cluster Analysis

The process starts with clarifying the objective of cluster analysis. The objective of cluster analysis in this study is to reveal subgroups of containerized

cargo exporters in Aegean Region considering their needs and wants. This is also the main purpose of our study. Clustering the population into smaller homogenous groups may help to better understand needs and wants of shippers in an efficient way. By this way, container shipping service providers can customize their marketing mix for each segment.

4.2.2.3.2 Selection of Cluster Variables

Since the purpose of cluster analysis is to create homogenous subgroups for better understanding customer needs and customize marketing mix accordingly, selection criteria of exporters are decided as the clustering variable. However, several issues need to be addressed when choosing which variables to include in the analysis. First, the variables used in the analysis should be theoretically and conceptually relevant for the objective of study. The cluster analysis does not detect if a variable is conceptually relevant or not, hence it is the responsibility of researcher to evaluate the appropriateness of variables. Only selection criteria of exporters are used in the analysis and they are relevant to understand benefits sought by the exporters.

This dissertation employs the factor scores instead of including each single variable to the analysis. Factor scores are defined as “*composite scores estimated for each respondent on the derived factors*” (Malhotra and Birks, 2007: P. 648). Factor scores are standardized values, which have a mean value of 0 and standard deviation of 1 (Hair et al., 2014). Factors scores can be calculated by several ways such as simple mean score calculation or using more advanced techniques such as Bartlett’s Score, Regression Scores, and Anderson-Rubin Scores (DiStefano et al. 2009). In this study, regression-based standardized scores of the five factors are preferred. Regression method is the most common and recognized approach for obtaining factor scores (Rencher, 2002, p.439).

Using factor scores have some advantages as well. First, it helps to eliminate multicollinearity, otherwise which deteriorates the results of cluster analysis (Hair et al., 2014). It is very important in cluster analysis that the variables used in analyses should not be correlated (Ketchen and Shook, 1996). Producing factor scores replacing the original single variables reduce the inter-correlation between the

variables. Below correlation table also proves that no correlation exists between the five factors used in the cluster analysis.

Table 38: Correlation Matrix of the Factor Scores Used in Cluster Analysis

		Value added services	Responsiveness	Cost	Time	Relational
Value added services	Pearson	1	,000	,000	,000	,000
	Correlation					
	Sig. (2-tailed)		1,000	1,000	1,000	1,000
	N	356	356	356	356	356
Responsiveness	Pearson	,000	1	,000	,000	,000
	Correlation					
	Sig. (2-tailed)	1,000		1,000	1,000	1,000
	N	356	356	356	356	356
Cost	Pearson	,000	,000	1	,000	,000
	Correlation					
	Sig. (2-tailed)	1,000	1,000		1,000	1,000
	N	356	356	356	356	356
Time	Pearson	,000	,000	,000	1	,000
	Correlation					
	Sig. (2-tailed)	1,000	1,000	1,000		1,000
	N	356	356	356	356	356
Relational	Pearson	,000	,000	,000	,000	1
	Correlation					
	Sig. (2-tailed)	1,000	1,000	1,000	1,000	
	N	356	356	356	356	356

Regression-based factor scores are more advantageous comparing to, for instance, mean score calculation of each respondent to the factors because mean calculation does not consider the size of factor loadings of variables to the factor (DiStefano et al., 2009). Treating all variables as they have the same factor loadings might cause misleading results as their effects on the factor vary, especially in some factors, significantly. For instance, in this dissertation, “quick response to inquiries” variable has higher factor loading than “on time sailing” variable in the responsiveness factor. Overlooking this difference might be problematic especially when interpreting the output of clustering analysis.

4.2.2.3.3 Standardization of Variables / Cases

Standardization of variables is necessary in cluster analysis if the scale ranges of variables are different. For instance, the annual sales volume and number of employee might be included as input to the cluster analysis. Or one variable can be five-point scale while the other is ten-point scale. In such cases, standardization is required for the variable. This study does not need standardization of variables because all scales are seven-point, and factor scores, which are already standardized values, are used in clustering. However, case-standardization is needed because the aim is to measure a respondent's perceived importance level to a selection criteria factor.

According to Hair et al. (2014), it is better to standardize the cases to reduce response-style effects (some respondents may be “yea-sayers” while other may be “naysayers”). For instance, transit time can be very important both for Respondent A and Respondent B. While Respondent A chooses 7 to indicate importance level, Respondent B may choose 6. However, 6 can be the highest score in the eye Respondent B, and it does not mean that transit time is less important for him/her than Respondent A. SPSS hierarchical cluster analysis has an option to standardize cases. Both standardized and non-standardized alternatives are tried, and it is witnessed that the non-standardized alternative produces poorer results. For instance, the number of members in segments is too imbalanced (largest is 169, smallest is 27). The piling of objects in one large cluster also causes lack of homogeneity within cluster.

4.2.2.3.4 Selection of Distance Measure

Distance measures are the most commonly used similarity measures in cluster analysis (Hair et al., 2014: p. 431). The similarity of two objects, respondents in other words, is measured by calculating the proximity of them. The proximity of two objects is evaluated by considering $n \times p$ multivariate data matrix as shown in below formula. Entering x_{ij} into $\mathbf{X}$ describes the score of j th variable on object I (Everitt et al. 2011, p. 5).

$$X = \begin{pmatrix} X_{11} & X_{12} & \dots & X_{1P} \\ X_{21} & X_{22} & \dots & \dots \\ \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot \\ X_{n1} & \dots & \dots & X_{nP} \end{pmatrix}$$

Several distance measurement method exists to be used in cluster analysis. The most famous ones are Euclidean distance, squared Euclidean distance, city-block (Manhattan) distance, Mahalanobis distance, and Chebychev distance. Among these measures, Euclidean distance is the most commonly used distance measure (Kaufman and Rousseeuw, 1990: p.11; Malhotra and Birks, 2007: p. 675). Euclidean distance is defined as “*the square root of the sum of the squared differences in values for each variable*” (Malhotra and Birks, 2007: p. 675) and the formula of this distance is illustrated as below. Squared Euclidean distance is same as Euclidean but without calculating the square root. This provides important advantages in calculation and is especially preferred for Ward’s method for clustering (Hair et al., 2014).

$$D(i, j) = \sqrt{(x_{i1} - x_{j1})^2 + (x_{i2} - x_{j2})^2 + \dots + (x_{ip} - x_{jp})^2}$$

City-block distance measure is the sum of the absolute differences of variables. Mahalanobis distance is defined as “*a generalized distance measure that accounts for the correlations among variables in a way that weights each variable equally*” (Hair et al., 2014: p. 432). The maximum absolute difference between two observations is called as Chebychev distance. This study chooses squared Euclidean distance as it is the suggested distance measure for Ward’s method (Hair et al., 2014). Euclidean distances are also considered to be ideal in cluster analysis because dissimilarities can be interpreted as physical distances using this measure (Everitt et al., 2011). Nonetheless, other distance measures were also carried out in our research, but the cluster results were poorer compared to the squared Euclidean.

4.2.2.3.5 Selecting a Clustering Algorithm

One of the most fundamental decisions to be taken is selecting the clustering algorithm method. Two basic types of clustering algorithm exist: Hierarchical clustering and non-hierarchical clustering. The hierarchical clustering has two different procedures: agglomerative methods and divisive methods. Non-hierarchical clustering approach has three different classes: sequential threshold, parallel threshold, and optimizing threshold (Malhotra and Birks, 2007)

In agglomerative approach, one type of hierarchical clustering, an object is merged to the most similar object in each step until the entire population is represented through a single cluster. In other words, in agglomerative approach, each object is a cluster at the beginning and the number of clusters decreases at each step until all of the clusters are combined under a single cluster. The divisive approach is the opposite of agglomerative approach. It starts as each object is accumulated in a single cluster, and then it is divided into further clusters (Rencher, 2002).

Malhotra and Birks (2007) state that agglomerative methods are common in marketing research, and they are divided into three as linkage methods, variance methods (Ward's method), and centroid method. The linkage methods also consists of three different options as single-linkage method (nearest neighbor method), complete-linkage method (farthest neighbor), and average linkage method. Single linkage is concerned with the minimum distance, thus the two items emerge first are the ones which have the shortest distance. Complete linkage, on the other hand, is concerned with maximum distance while average linkage is based on the average of distances (Hair et al., 2014).

Centroid method is carried out based on the geometric center of each cluster. In this method, to calculate centroids, average values of objects on cluster variables are computed (Sarstedt and Mooi, 2014). Hair et al. (2014) claims that centroid method is usually preferred by the researchers in physical and life sciences, and the results of this method might be confusing to make interpretation.

Another agglomerative approach, Ward's method (a variance method) is designed to minimize the variance within a cluster (Malhotra and Birks, 2007). This method is different than the previous ones because similarity is measured by "*sum of squares within the clusters summed over all variables*", rather than calculating the

similarity as a single distance (Hair et al., 2014: p.442). Ward's method has the advantage of producing clusters with equal or similar sizes. Sarstedt and Mooi (2014) also suggest using Ward's method to have somewhat similar cluster sizes. Malhotra and Birks (2007) also states that Ward's method is one of the most preferred hierarchical clustering algorithm.

Among the agglomerative methods, average linkage and Ward's method are found to be more effective than others (Malhotra and Birks, 2007). In our research, both methods were run and Ward's method performed better than the average linkage method. The cluster structure achieved using the average linkage was very difficult to interpret. Besides, several B2B segmentation studies also used Ward's method as clustering algorithm (Jadcakova, 2013; Rangan et al., 1992; Shahrabi et al., 2009). Accordingly, Ward's Method has been chosen as the hierarchical clustering method. Readers are advised to refer Everitt et al. (2011) concerning the formulation details of these methods.

In addition to hierarchical clustering algorithms, non-hierarchical K-means clustering was also performed to check the results. Some studies run both hierarchical and non-hierarchical cluster analyses (Buss, 2014; Terho and Halinen, 2012). Non-hierarchical cluster analysis is believed to be advantageous because in hierarchical cluster analysis early combinations of two undesirable variables may occur (Hair et al., 2014). Another advantage of non-hierarchical cluster analysis is that it is effective in large data sets due to its simplicity in calculation. This is probably why passenger transport studies in our literature review, which have very large sample sizes, use K-means for clustering more than the B2B studies.

However, non-hierarchical cluster algorithm also has some disadvantages (Malhotra and Birks, 2007). First, number of clusters must be determined prior to the analysis. Second, cluster center selection is a subjective decision, which is critical considering the fact that the entire results of cluster analysis depends on how these centers are selected. Besides, as Hair et al. (2014) also suggests, non-hierarchical cluster analysis does not let researchers to evaluate different cluster solutions. Moreover, if the seed points are not specified effectively, and if they are determined in a random way, non-hierarchical clustering results are usually poorer than hierarchical ones.

Our results in K-means analysis revealed unbalanced cluster solutions. We run the analysis by indicating the number of clusters as 4, 5, 6, 7, and 8 respectively but none of them revealed effective clusters to make reasonable judgments or interpretations. Thus, considering the fact that our sample is not too large and the poor results of K-means clustering, Ward's method with squared Euclidean distance is selected as the sole clustering solution. Many B2B and consumer studies also perform only hierarchical cluster analysis (Bennion, 1987; Choffray and Lillien, 1980; Crittenden et al., 2002; Jadcakova, 2013; Prilwittz, 2011; Rangan et al., 1992; Shahrabi et al., 2009; Thomas, 2016).

4.2.2.3.6 Deciding on Number of Clusters

An important issue when applying cluster analysis is the choice of number of segments. Although several procedures are recommended in the literature (Milligan et al., 1985), there is no certain, objective, or "the best" approach for determining the number of clusters (Hair et al., 2014). Cluster analysis is actually a non-inferential and exploratory technique that the ideal number of cluster solution is based on the theory and judgment of the researcher (Malhotra and Birks, 2007). Yet, there are some recommendations and guides that can help researchers to decide on number of clusters (Ketchen and Shook, 1996: p.446).

One of the most common methods of choosing the number of clusters is analyzing the coefficients in agglomeration schedule produced in SPSS (Hair et al., 2014). By checking the coefficients, it is possible to find out the stopping point for determining number of clusters. When a major or radical increase occurs in the coefficients, it can be a potential candidate for stopping the agglomeration of clusters (Ketchen and Shook, 1996). The final step in Table 39 is stage 355 (n-1), which is a one cluster solution. The value of coefficient change comparing the previous stage to achieve one cluster solution is 1415, which is significantly more than the previous coefficient rate (1061). To better illustrate, change of percentage in coefficient values are included into the standard agglomeration schedule table of SPSS. Following the sequence of coefficient value changes, the most significant change occurs at the four cluster solution. In other words, coefficient of having 3-cluster solution is

significantly higher than having 4-cluster solution. Thus, we should have minimum 4-cluster solution based on the agglomeration schedule.

Table 39: Agglomeration Schedule of Hierarchical Cluster Analysis Results

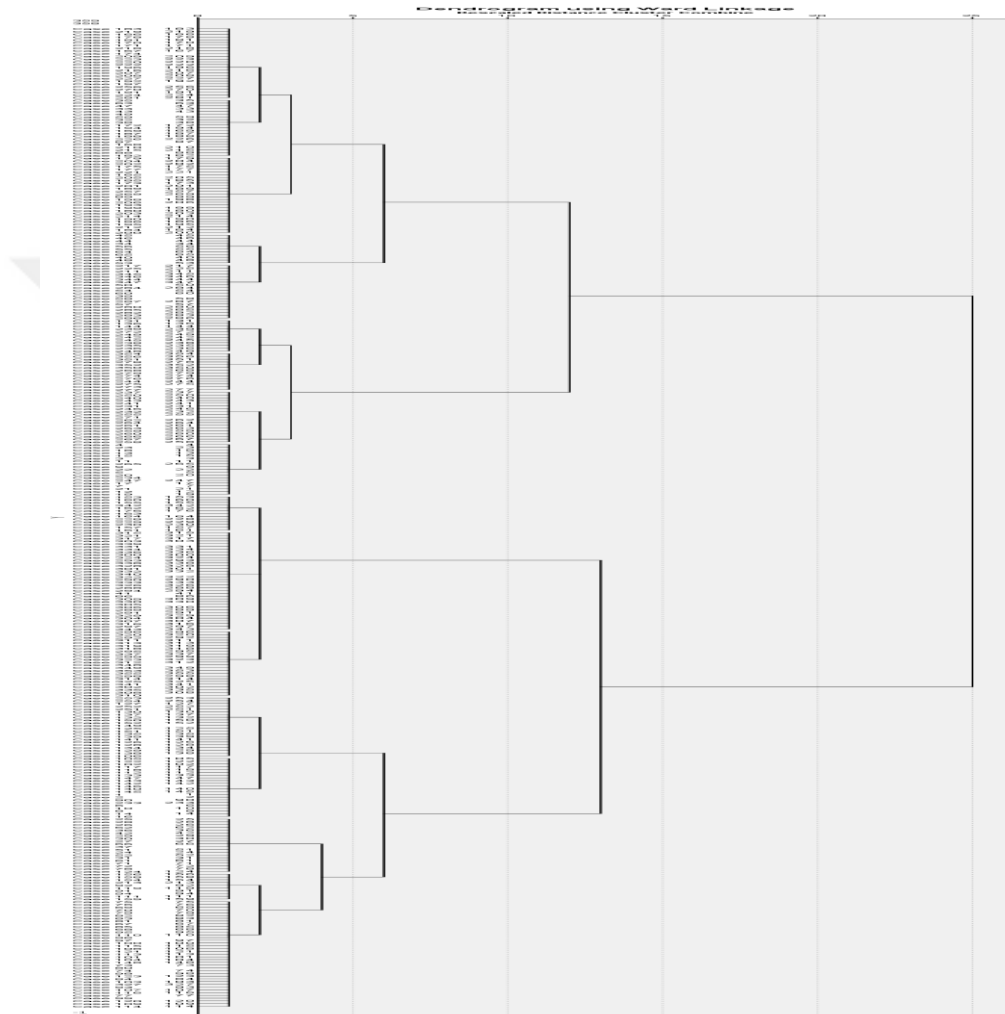
Stage	Cluster Combined		Coefficients	Change of percentage	Stage Cluster First Appears		Next Stage
	Cluster 1	Cluster 2			Cluster 1	Cluster 2	
1	183	219	,000	0,0%	0	0	2
2	166	183	,000	0,0%	0	1	4
3	178	181	,000	0,0%	0	0	4
.....	...	...	...	...	...	...	...
....	...	...	...	...	...	...	...
344	1	106	363,495	6,3%	339	323	351
345	3	231	386,365	7,1%	333	331	349
346	41	153	413,762	6,8%	342	329	354
347	32	166	442,074	8,9%	330	328	348
348	32	89	481,309	8,5%	347	338	352
349	3	131	522,418	9,3%	345	341	353
350	24	67	570,877	12,5%	337	343	351
351	1	24	642,100	12,9%	344	350	354
352	32	34	724,756	22,9%	348	340	353
353	3	32	891,002	19,1%	349	352	355
354	1	41	1061,091	33,4%	351	346	355
355	1	3	1415,004	END	354	353	0

Although the most significant coefficient increase is witnessed between 3-cluster and 4-cluster solutions, the percentage difference between 6-cluster solution and 5-cluster solution (12,5%) is also significantly higher than the previous changes. All the percentages of previous changes are lower than 10 percent but the difference between these two solutions is higher than 10 percent. It means that 6-cluster solution can also be an optimum number of clusters in our case.

Another approach is to assess the dendrogram which is a tree diagram that displays the distance and dissimilarity of objects in cluster analysis (Hair et al., 2014). As shown in Figure 19, the dendrogram illustrates the distances graphically where the clusters merge. The closer the distance the more homogenous a cluster is.

If the distance of agglomeration of clusters increases, it causes within-cluster heterogeneity. According to the dendrogram, 6, 4, and 2 cluster solutions seem to be the potential candidates.

Figure 19: Display of Dendrogram for Detecting Number of Clusters



Two-cluster solution is not chosen since the members in the same cluster show heterogeneous characteristics in terms of reaction to selection criteria. Four-cluster solution has less within-heterogeneous pattern comparing to two-cluster solution. Yet, the clusters are still not quite homogenous as desired. The profiling questions are not as distinctive as they are in the six-cluster solution. We also tried 7, 8 and 9 cluster solutions but very small segment sizes started to emerge i.e. 19 members. The balanced number of clusters is another determinant of cluster number

especially in marketing research (Malhotra and Birks, 2007). Accordingly, considering all these issues discussed above, six-cluster solution is found more appropriate in our study.

4.2.2.4. Interpretation of Segments

The six-cluster solution provides clusters that have balanced distribution of member sizes. Among the six segments found through cluster analysis, the smallest one in terms of member size has 31 members while the largest one has 75 members (mean of the number of members is 59 while the median is 66). As shown in the Table 40, the first cluster has 44 members, the second has 64 members, the third has 69 members, the forth has 75 member, the fifth has 31, and finally the sixth cluster has 73 members.

Table 40: Frequency of Cluster Members

Cluster	No of members	Percentage	Valid percentage	Cumulative percentage
1	44	12,4%	12,4%	12,4%
2	64	18,05%	18,0%	30,3%
3	69	19,4%	19,4%	49,7%
4	75	21,1%	21,1%	70,8%
5	31	8,7%	8,7%	79,5%
6	73	20,5%	20,5%	100,0%
Total	356	100,0%	100,0%	

The names of the segments are determined based on their average scores in selection criteria. In Table 41, mean values of clusters on selection criteria factor scores are presented. The average value of each factor scores is 0. For instance, if a cluster's value of a factor score is below 0, it means that this cluster's average factor score is less than overall average score of that factor. The highest value added service score belongs to segment 4 while the lowest VAS belongs to Segment 1. Similarly, the highest average cost value belongs to Segment 1 while the lowest belongs to Segment 5.

Table 41: Mean Values of Clusters' Selection Criteria Factor Scores

	Segments					
	1 Mean	2 Mean	3 Mean	4 Mean	5 Mean	6 Mean
Value added Services	-,68494	,57313	-,77638	1,14750	,31377	-,66797
Responsiveness	,05234	,34344	-,06451	-,76807	,39400	,35013
Cost	,72043	,11735	,64766	,05133	-1,48327	-,57214
Time	,30153	-,00719	-,55829	-,04600	-,63748	,67023
Relational	-,48454	-1,34593	,58469	,40437	,80146	,16361

Before describing the characteristics of each segment, one condition should be met: The means of factor scores must be significantly different across the segments. If the segmenting variables are not significantly different across the segments, segmenting this market does not have a substantial rationale. To see if means are significantly different, One-way Analysis of Variance (ANOVA) analysis is performed. The following null and alternative hypotheses are built:

H_0 = There is no difference in the mean selection criteria factor scores among the segments.

H_1 = There is a difference in the mean selection criteria factor scores among the segments.

According to the results illustrated in Table 42, our null hypothesis is rejected and we find support for our alternative hypothesis. It means that mean of selection criteria factor scores across the segments are significantly different.

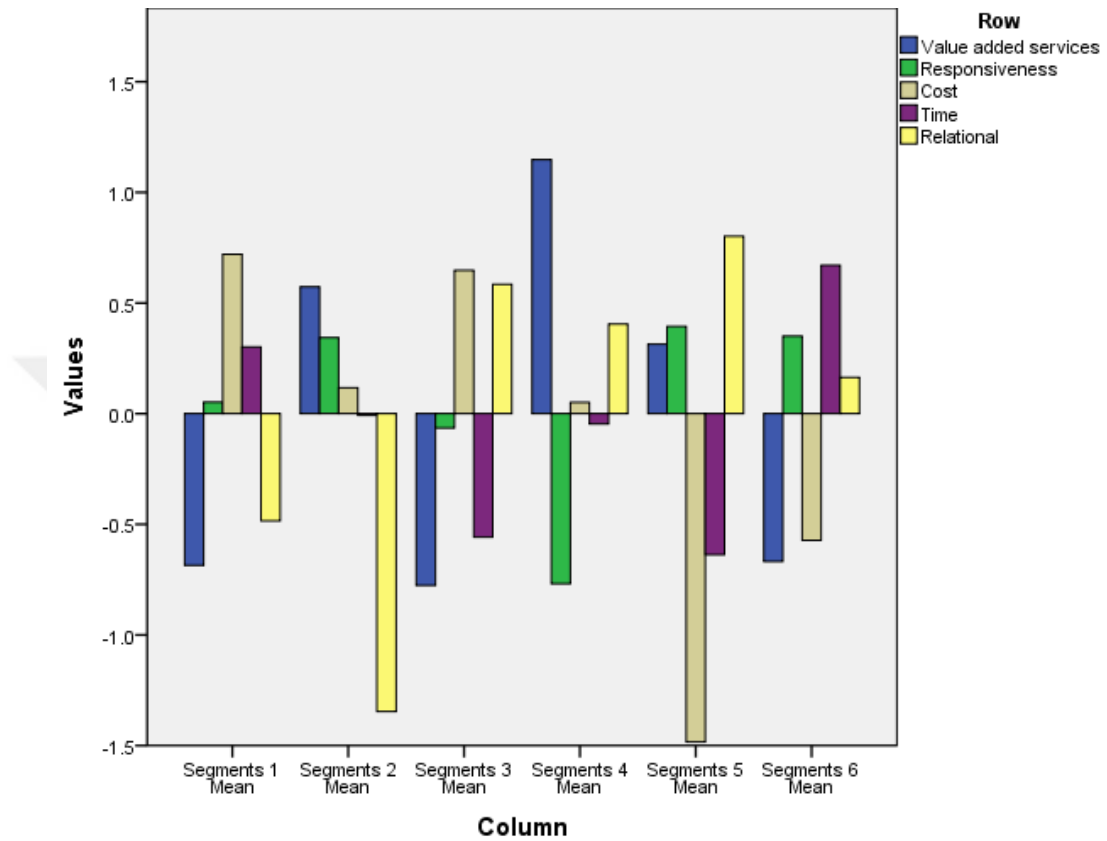
Table 42: One-way ANOVA Test of Clusters and Factor Scores

		Sum of Squares	df	Mean Square	F	Sig.
Value added services	Between Groups	217,636	5	43,527	110,906	,000
	Within Groups	137,364	350	,392		
	Total	355,000	355			
Responsiveness	Between Groups	65,963	5	13,193	15,975	,000
	Within Groups	289,037	350	,826		
	Total	355,000	355			
Cost	Between Groups	144,957	5	28,991	48,309	,000
	Within Groups	210,043	350	,600		
	Total	355,000	355			
Time	Between Groups	71,059	5	14,212	17,518	,000
	Within Groups	283,941	350	,811		
	Total	355,000	355			
Relational	Between Groups	183,986	5	36,797	75,310	,000
	Within Groups	171,014	350	,489		
	Total	355,000	355			

Figure 20 illustrates the scores of Table 42 in a graphical and easy to understand way. Examination of this figure helps to easily grasp the peculiar characteristics of each segment. It shows how each segment differs from each other in terms of segmenting variables (factor scores). The characteristics of each segment are presented here. An appropriate name will be devoted to each segment based on these characteristics. A precaution is required when evaluating the Figure 20. The height of the bars in a cluster does not show the most important or least important variable in that cluster. For instance, bar height of VAS in Segment 4 is much higher than the bar height of responsiveness. It does not mean that this cluster attach importance to VAS much more than responsiveness. It means that mean of VAS in this segment is much higher than average VAS score across the segments. Similarly,

mean of responsiveness in this segment is lower than the average responsiveness score across the segments.

Figure 20: Bar-chart Illustration of Average Factors Scores at Each Segment



Hair et al. (2014) suggests besides standardized factors scores, raw data clustering variable scores of the segments should also be presented. Table 43 below illustrated the factor means of each segment. These raw data mean values do not take factor loadings into consideration. These mean scores will be used when interpreting the within-segment importance rankings.

Table 43: Mean Scores of Factors for Each Segment (7-point scale)

	Segments					
	1	2	3	4	5	6
	Mean	Mean	Mean	Mean	Mean	Mean
VAS	3,84	5,01	3,99	5,87	5,12	3,92
Responsiveness	6,69	6,68	6,61	6,24	6,62	6,75
Cost	6,82	6,35	6,74	6,21	5,19	5,93
Time	6,68	6,27	5,88	5,97	5,52	6,90
Relational	4,95	4,53	5,72	5,88	6,00	5,36

Segment 1 has the highest mean value for cost factor. Its mean value for time is the second highest among the segments. Responsiveness value is very close to the average point. This segment has substantially lower VAS value. It also has the second lowest average relational factor value across the segments. The most prominent characteristic of this segment is its score on the cost. This segment is certainly a cost sensitive one comparing to other segments. But this characteristic resembles to Segment 3 as well. Yet, these two segments differ from each other in terms of time and relational factor. Considering these issues, Segment 1 is named as “*time-sensitive cost seekers*”.

Segment 2 stands out with its lowest score on the relational factor among the other segments. The relational factor includes personal relations, frequency of visiting, and consulting. It means that members in this segment make more pragmatic decisions than the other segments. The personal relations are less important. In this segment, the factors which have higher scores than average are VAS, responsiveness, and cost. Yet, scores of these factors are not largely higher than the average of all segments. Especially cost factor has a score very close to the average. Time factor is just right at the average level. Considering the segment’s extreme low score on relation and relatively higher scores on VAS and responsiveness, the name of this factor is determined as “*pragmatic service buyers*”.

Segment 3 has the second highest score on cost and relational factors across all segments. On the other hand, it has the lowest score on VAS, and second lowest score on time factor. Members in this segment attach particular importance on the cost of service, but unlike the “*time-sensitive cost seekers*”, their score on time is remarkably lower than the overall average. Relations are also important for this

segment, but VAS are almost not important at all similar to segment 1 and segment 6. Responsiveness of this segment is slightly above average point. The most prominent distinguishing characteristics of Segment 3 are its scores on cost and time. Hence, this segment is named as “*non-urgent cost seekers*”.

Segment 4 describes its most prominent feature by just taking a short look at the Figure 20. This is the segment where members attach importance to VAS significantly more than other segments. Importance given to cost is slightly above average while importance of time is very slightly below average. Another interesting characteristic of this group is that they have the lowest mean score on responsiveness factor. The reason can be the fact that members in this segment consider responsiveness as a criterion that is similar among the container shipping service providers. Nonetheless, due to its extreme higher score on VAS, this segment is named as “*VAS buyers*”.

Segment 5 has extreme values in more than one selection criteria factor. First, it has the highest mean score on relational factor. It also has the highest score on responsiveness just slightly above the Segment 6, but its height as shown in Figure 20 is not as high as the relation. Another extreme score of Segment 5 belongs to its score on the cost factor. It has the lowest score on cost at a scale that it has the lowest height among all the factors in the figure. Members of this segment also find time factor less important the average of overall segments. Score of VAS is larger than the average. This segment stands out with its high value of relational and low value of cost, which suggests that members in this segment may tend to be less pragmatic comparing to other segments. Nevertheless, this segment also scores higher on VAS and responsiveness more than the average point of overall segments. Taking the features of this segment, it is decided to name it as “*relationship seekers*”.

Segment 6 differs from other segments with its highest score on time factor among all segments. This segment also attaches higher importance to responsiveness factor compared to average of all segments. Another characteristic of this segment is that it has a low value on the cost factor (the second lowest score among the segments). Regarding time and cost scores, this segment is the opposite of “*non-urgent cost seekers*”, which scores high on cost and low on time. In contrast,

Segment 6 scores high on time and low on cost. Considering these issues, this segment is named as “*time seekers*”.

To summarize, the sample in this dissertation consists of total six segments. The names of these six segments are time-sensitive cost seekers, pragmatic service buyers, non-urgent cost seekers, VAS buyers, relationship seekers, and time seekers.

4.2.2.5 Cross tabulation of Descriptors and Segments

Total six segments are derived based on the several analyses in the dissertation. However, there are still many questions to be answered in the segmentation analysis. Who are the members of these segments? Which industries do they come from? What are their demographics such as container volume and number of employees? Is their cargo sensitive? Are their products expensive? These are some of the questions that this dissertation aims to find out. Hence, the next action – one of the most vital steps in the research – is to profile the segments.

Cross-tabulations are performed to illustrate characteristics of segments in terms of nominal variables. Since categories of a nominal variable is not equally distributed (i.e. smallest category of industry has 16 members while the largest has 71, number of smallest category of ICB is 91 while the number of largest one is 141), we do not only consider the percentages of categories based on the counts within a segment, but also we consider how much percent of a category is located across the segments. A Chi-square analysis is embedded to tabulations to check if there is a significant association between the categories of nominal variable and segment membership. In addition, adjusted residuals are also included in the cross-tabulations. Adjusted residuals, which are z-scores, are used to carry out post-hoc tests in Chi-square. If adjusted residual is over 1.96, then it means that category in the segment membership (the single cell) is significantly more or less depending whether the sign of number is positive or negative (MacDonald and Gardner, 2000).

Industry of shippers across segments

The first and one of the most important firmographics is the distribution of industries across segments. A cross-tabulation is created to investigate six segments

and 10 industry categories. It is of significant importance to detect disproportionate distribution of industry categories across segments. It would provide criterion and practical validity as well as meet the criteria of segmentation such as accessible and actionable.

Table 44: Cross-tabulation of Industry and Segment Membership

Industry	TCS	PSB	NCS	VASB	RS	TS	Total
Minerals	6	7	26	7	1	1	48
<i>Expected Count</i>	5,9	8,6	9,3	10,1	4,2	9,8	48,0
% within Industry	12,5%	14,6%	54,2%	14,6%	2,1%	2,1%	100,0%
% within Segments	13,6%	10,9%	37,7%	9,3%	3,2%	1,4%	13,5%
Adjusted Residual	,0	-,7	6,6	-1,2	-1,8	-3,4	
Tiles&Ceramics	2	3	9	12	3	10	39
<i>Expected Count</i>	4,8	7,0	7,6	8,2	3,4	8,0	39,0
% within Industry	5,1%	7,7%	23,1%	30,8%	7,7%	25,6%	100,0%
% within Segments	4,5%	4,7%	13,0%	16,0%	9,7%	13,7%	11,0%
Adjusted Residual	-1,5	-1,8	,6	1,6	-,2	,8	
Machine	6	2	5	3	1	20	37
<i>Expected Count</i>	4,6	6,7	7,2	7,8	3,2	7,6	37,0
% within Industry	16,2%	5,4%	13,5%	8,1%	2,7%	54,1%	100,0%
% within Segments	13,6%	3,1%	7,2%	4,0%	3,2%	27,4%	10,4%
Adjusted Residual	,8	-2,1	-1,0	-2,0	-1,4	5,3	
Refrigerated food	3	8	1	5	0	13	30
<i>Expected Count</i>	3,7	5,4	5,8	6,3	2,6	6,2	30,0
% within Industry	10,0%	26,7%	3,3%	16,7%	0,0%	43,3%	100,0%
% within Segments	6,8%	12,5%	1,4%	6,7%	0,0%	17,8%	8,4%
Adjusted Residual	-,4	1,3	-2,3	-,6	-1,8	3,2	
Dry food	10	17	9	16	10	9	71
<i>Expected Count</i>	8,8	12,8	13,8	15,0	6,2	14,6	71,0
% within Industry	14,1%	23,9%	12,7%	22,5%	14,1%	12,7%	100,0%
% within Segments	22,7%	26,6%	13,0%	21,3%	32,3%	12,3%	19,9%
Adjusted Residual	,5	1,5	-1,6	,3	1,8	-1,8	
Spare part	4	8	3	10	3	7	35
<i>Expected Count</i>	4,3	6,3	6,8	7,4	3,0	7,2	35,0
% within Industry	11,4%	22,9%	8,6%	28,6%	8,6%	20,0%	100,0%
% within Segments	9,1%	12,5%	4,3%	13,3%	9,7%	9,6%	9,8%
Adjusted Residual	-,2	,8	-1,7	1,1	,0	-,1	

Table 44 (Continued)

Industry	TCS	PSB	NCS	VASB	RS	TS	Total
Fashion	1	2	1	8	1	5	18
Expected Count	2,2	3,2	3,5	3,8	1,6	3,7	18,0
% within Industry	5,6%	11,1%	5,6%	44,4%	5,6%	27,8%	100,0%
% within Segments	2,3%	3,1%	1,4%	10,7%	3,2%	6,8%	5,1%
Adjusted Residual	-,9	-,8	-1,5	2,5	-,5	,8	
Textile	1	3	1	5	4	2	16
Expected Count	2,0	2,9	3,1	3,4	1,4	3,3	16,0
% within Industry	6,3%	18,8%	6,3%	31,3%	25,0%	12,5%	100,0%
% within Segments	2,3%	4,7%	1,4%	6,7%	12,9%	2,7%	4,5%
Adjusted Residual	-,8	,1	-1,4	1,0	2,4	-,8	
Chemicals&Plastics	8	5	10	4	2	5	34
Expected Count	4,2	6,1	6,6	7,2	3,0	7,0	34,0
% within Industry	23,5%	14,7%	29,4%	11,8%	5,9%	14,7%	100,0%
% within Segments	18,2%	7,8%	14,5%	5,3%	6,5%	6,8%	9,6%
Adjusted Residual	2,1	-,5	1,6	-1,4	-,6	-,9	
Others	3	9	4	5	6	1	28
Expected Count	3,5	5,0	5,4	5,9	2,4	5,7	28,0
% within Industry	10,7%	32,1%	14,3%	17,9%	21,4%	3,6%	100,0%
% within Segments	6,8%	14,1%	5,8%	6,7%	19,4%	1,4%	7,9%
Adjusted Residual	-,3	2,0	-,7	-,4	2,5	-2,3	
Count	44	64	69	75	31	73	356
Expected Count	44,0	64,0	69,0	75,0	31,0	73,0	356,0

* TCS= Time-sensitive cost seekers, PSB= Pragmatic service buyers, NCS= Non-urgent cost seekers, VASB= Value-added service buyers, RS= relational seekers, TS= Time seekers

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	141,280 ^a	45	,000
Likelihood Ratio	136,363	45	,000
Linear-by-Linear Association	,804	1	,370
N of Valid Cases	356		

a. 25 cells (41,7%) have expected count less than 5. The minimum expected count is 1,39.

Table 44 demonstrates that great and significant majority of minerals category fall into the NCS segment. Number of minerals member (only 1) in Time seeker segment, on the other hand, is significantly less than other categories in that

segment. Only 2.1% of minerals are in time seeker segment. The ratio of minerals in relation seekers is also 2.1%, but the size of this segment is 31 while the size of time seekers is 73. Hence, the expected count of minerals in time seekers segment (9,8) is larger than relation seeker segment (4,2). This is why Z-score of minerals / time seekers cell is larger than Z-score of minerals / relation seekers. Minimum expected counts are not displayed in this table as it increases the size of table to the extent that it becomes difficult to follow.

Great majority of tiles and ceramics category are located in VAS buyers segment with the ratio of 30.8%. It is followed by time seekers with a percentage of 25.6 and then non-urgent cost seekers with a percentage of 23.1. Tiles and ceramics industry is distributed to different segments at similar ratios. Times seekers and non-urgent cost seekers seem to have opposite characteristics, yet the ratio of membership is very close to each other. This situation suggests that tiles and ceramics industry is quite heterogeneous within itself.

Significant majority of machine industry is located in time seekers segment. The frequency of machine in pragmatic service buyers and VAS buyers segments is significantly less than expected count. The ratio of machine industry in non-urgent cost seekers segment is also less than expected, though not statistically significant. Similar to machine industry, statistically significant majority of refrigerated foods industry falls into the segment of time seekers. Number of refrigerated foods is significantly small in the non-urgent cost seekers segment, which is practically very reasonable.

Majority of dry food industry is found in the segment of PSB. The industry also generates over a quarter of PSB segment. Although only 10.1% of dry foods are situated in RS segment, over 30% of this segment is consisted of dry foods. This is why this cell has the highest adjusted residual score within this industry category. Dry foods industry can be considered to be proportionately distributed across segments. Majority of spare parts industry, on the other hand, is in the VASB segment. Considering the adjusted residuals, the highest negative score of spare parts industry occurs in NCS segment. It means that it is low chance that a spare part shipper is a member of NCS segment.

Great and significant majority of the fashion industry falls into the VASB segment with a ratio of 44% of fashion category. Around 27% of fashion industry is located in TS segment. The largest negative sign of adjusted residual score intersects at the NCS segment, which indicates that it is less likely for a fashion shipper to be located in NCS segment. Similar to fashion, majority of textile shippers are resided in VASB segment. It is followed by RS segment where textile shippers significantly exist more than expected.

Majority of chemicals and plastics are located in NCS and TCS segments with the percentages of around 29 and 25 in order. Both these two segments are cost sensitive, thus more than 50 percent of the chemicals and plastics industry are in the segments where members tend to attach more importance to cost than other segments. According to the adjusted residuals, the association between this industry and TCS segment is greater though the ratio is 4 percent lower than TCS cell. It is because population of NCS is much larger than TCS segment. Since others consist of many different small numbers of other industries, results are not presented in text.

Industry Benchmark Classification of segments

Besides the industry of shippers, it is also of vital importance to investigate ICB of them, especially the distribution of ICB of shippers across the segments. ICB is a useful tool to examine the proportion of shippers' goods in terms of basic materials, industrial goods, or consumer products.

Table 45: Cross-Tabulation of ICB and Segments

	TCS	PSB	NCS	VASB	RS	TS	Total
Basic Materials	13	14	36	14	7	7	91
<i>Expected count</i>	11,2	16,4	17,6	19,2	7,9	18,7	91,0
% within ICB	14,3%	15,4%	39,6%	15,4%	7,7%	7,7%	100,0%
% within Segments	29,5%	21,9%	52,2%	18,7%	22,6%	9,6%	25,6%
Adjusted Residual	,6	-,7	5,6	-1,5	-,4	-3,5	
Industrials	16	18	18	25	7	34	118
<i>Expected count</i>	14,6	21,2	22,9	24,9	10,3	24,2	118,0
% within ICB	13,6%	15,3%	15,3%	21,2%	5,9%	28,8%	100,0%
% within Segments	36,4%	28,1%	26,1%	33,3%	22,6%	46,6%	33,1%

Adjusted Residual	,5	-,9	-1,4	,0	-1,3	2,7	
Consumer	15	32	15	36	17	32	147
<i>Expected count</i>	18,2	26,4	28,5	31,0	12,8	30,1	147,0
% within ICB	10,2%	21,8%	10,2%	24,5%	11,6%	21,8%	100,0%
% within Segments	34,1%	50,0%	21,7%	48,0%	54,8%	43,8%	41,3%
Adjusted Residual	-1,0	1,6	-3,7	1,3	1,6	,5	
Total	44	64	69	75	31	73	356
% within ICB	12,4%	18,0%	19,4%	21,1%	8,7%	20,5%	100,0%
% within Segments	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	45,623 ^a	10	,000
Likelihood Ratio	44,539	10	,000
Linear-by-Linear Association	6,261	1	,012
N of Valid Cases	356		

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 7,92.

First of all, the chi-square test demonstrates a significant relationship exists between the industry categories and segment membership. Taking Table 45 into consideration, a significant majority (around 40%) of basic materials are located in non-urgent cost seekers segment. Basic materials also generate over 50% of NCS segment alone. The distribution of basic materials is evenly distributed across TCS, PSB, and VASB segments with a percentage of around 15. Considering the significant negative adjusted residual score being a member of time seekers segment has the lowest chance for basic materials shippers. Share of basic materials in TS segment accounts for only 9.6 percent.

On the other hand, significant majority of industrial goods are located in TS segment. The segments that industrial goods shippers are least associated are NCS and RS. Regarding the consumer products, the most prominent and significant feature is its significant negative association with NCS segment. Only 10% of consumers are located in this segment. This segment also has the lowest share of consumers (21%) among other ICB categories.

Cargo value per container across segments

The three categories of cargo value per containers are also disproportionately – which is desired in segment description – distributed across the segments. Majority of low value cargoes are significantly accumulated in NCS segment with a rate of around 37 percent. The low value cargoes also generate over 46 percent of NCS segment. On the other hand, the lowest chance of a low cargo for being a member belongs to TS segment and VASB segments in order. These cells have significant negative signs.

Table 46: Cross-Tabulation of Cargo Value and Segments

	TCS	PSB	NCS	VASB	RS	TS	Total
Low value	14	19	32	10	5	6	86
<i>Expected Count</i>	10,6	15,5	16,7	18,1	7,5	17,6	86,0
% within container value	16,3%	22,1%	37,2%	11,6%	5,8%	7,0%	100,0%
% within Segments	31,8%	29,7%	46,4%	13,3%	16,1%	8,2%	24,2%
Adjusted Residual	1,3	1,1	4,8	-2,5	-1,1	-3,6	
Medium value	23	32	31	38	23	49	196
<i>Expected Count</i>	24,2	35,2	38,0	41,3	17,1	40,2	196,0
% within container value	11,7%	16,3%	15,8%	19,4%	11,7%	25,0%	100,0%
% within Segments	52,3%	50,0%	44,9%	50,7%	74,2%	67,1%	55,1%
Adjusted Residual	-,4	-,9	-1,9	-,9	2,2	2,3	
High value	7	13	6	27	3	18	74
<i>Expected Count</i>	9,1	13,3	14,3	15,6	6,4	15,2	74,0
% within container value	9,5%	17,6%	8,1%	36,5%	4,1%	24,3%	100,0%
% within Segments	15,9%	20,3%	8,7%	36,0%	9,7%	24,7%	20,8%
Adjusted Residual	-,9	-,1	-2,8	3,7	-1,6	,9	
Total	44	64	69	75	31	73	356
<i>Expected Count</i>	44,0	64,0	69,0	75,0	31,0	73,0	356,0
% within container value	12,4%	18,0%	19,4%	21,1%	8,7%	20,5%	100,0%
% within Segments	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%

Low= 0-14.999USD, Medium= 15.000-44.999USD, High= 45.000USD and more

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	50,103 ^a	10	,000
Likelihood Ratio	50,515	10	,000
Linear-by-Linear Association	13,080	1	,000

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 6,44.

Majority of medium value cargoes are located in TS segment with a rate of 25 percent. This segment has the highest chance to include a medium cargo value shipper to extent that 67 percent of this segment is also comprised of medium value cargoes. Around 12 percent of medium value category is located in RS segment, yet this category generates 74% of this segment. The strongest negative association of medium value group occurs with NCS segment. Great and significant majority of high value shippers are situated in VASB segment. The largest negative difference between the actual count and expected count appears in NGC segment. Although the association is not significant, the largest positive difference between actual count and expected counts in TCS segment belongs to low value shipper category. Similarly, though not significant, the largest positive adjusted residual in PSB segment belongs to low value shippers as well.

Destination of shippers across segments

The respondents answered the questions considering their most frequent seaway destination port. There are total 7 categories and “others” consisting of shipments to South America, Black Sea, West Africa, and East Africa. Considering the adjusted residual values, the most disproportionate distribution occurs in the category of North Europe. The highest, and also significant, positive relation is coincided with TCS segment. Over 38% of this segment’s members ship their cargoes mostly to North Europe. Strong negative relation appears in RS and NCS segments. South & East Europe group is distributed evenly across segments. Though no significant association exists between Fars East and Asia group and segments, the majority of this group is located in NCS segment. Same is applicable for North America group as well but the association is also significant for this group.

Table 47: Cross-Tabulation of Destination of Shippers and Segments

Destination	TCS	PSB	NCS	VASB	RS	TS	Total
North Europe	17	20	11	22	3	17	90
<i>Expected Count</i>	11,1	16,2	17,4	19,0	7,8	18,5	90,0
% within destination	18,9%	22,2%	12,2%	24,4%	3,3%	18,9%	100,0%
% within Segments	38,6%	31,3%	15,9%	29,3%	9,7%	23,3%	25,3%
Adjusted Residual	2,2	1,2	-2,0	,9	-2,1	-,4	
South and East Europe	2	5	7	5	3	7	29
<i>Expected Count</i>	3,6	5,2	5,6	6,1	2,5	5,9	29,0
% within destination	6,9%	17,2%	24,1%	17,2%	10,3%	24,1%	100,0%
% within Segments	4,5%	7,8%	10,1%	6,7%	9,7%	9,6%	8,1%
Adjusted Residual	-,9	-,1	,7	-,5	,3	,5	
Far East and Asia	7	5	14	8	2	14	50
<i>Expected Count</i>	6,2	9,0	9,7	10,5	4,4	10,3	50,0
% within destination	14,0%	10,0%	28,0%	16,0%	4,0%	28,0%	100,0%
% within Segments	15,9%	7,8%	20,3%	10,7%	6,5%	19,2%	14,0%
Adjusted Residual	,4	-1,6	1,7	-,9	-1,3	1,4	
North America	5	8	17	11	6	11	58
<i>Expected Count</i>	7,2	10,4	11,2	12,2	5,1	11,9	58,0
% within destination	8,6%	13,8%	29,3%	19,0%	10,3%	19,0%	100,0%
% within Segments	11,4%	12,5%	24,6%	14,7%	19,4%	15,1%	16,3%
Adjusted Residual	-,9	-,9	2,1	-,4	,5	-,3	
East Mediterranean	4	9	4	1	2	7	27
<i>Expected Count</i>	3,3	4,9	5,2	5,7	2,4	5,5	27,0
% within destination	14,8%	33,3%	14,8%	3,7%	7,4%	25,9%	100,0%
% within Segments	9,1%	14,1%	5,8%	1,3%	6,5%	9,6%	7,6%
Adjusted Residual	,4	2,2	-,6	-2,3	-,2	,7	
Middle East	6	10	8	14	9	10	57
<i>Expected Count</i>	7,0	10,2	11,0	12,0	5,0	11,7	57,0
% within destination	10,5%	17,5%	14,0%	24,6%	15,8%	17,5%	100,0%
% within Segments	13,6%	15,6%	11,6%	18,7%	29,0%	13,7%	16,0%
Adjusted Residual	-,5	-,1	-1,1	,7	2,1	-,6	
North Africa	2	3	7	1	4	5	22
<i>Expected Count</i>	2,7	4,0	4,3	4,6	1,9	4,5	22,0
% within destination	9,1%	13,6%	31,8%	4,5%	18,2%	22,7%	100,0%
% within Segments	4,5%	4,7%	10,1%	1,3%	12,9%	6,8%	6,2%
Adjusted Residual	-,5	-,5	1,5	-2,0	1,6	,3	
Others	1	4	1	13	2	2	23
<i>Expected Count</i>	2,8	4,1	4,5	4,8	2,0	4,7	23,0
% within destination	4,3%	17,4%	4,3%	56,5%	8,7%	8,7%	100,0%
% within Segments	2,3%	6,3%	1,4%	17,3%	6,5%	2,7%	6,5%
Adjusted Residual	-1,2	-,1	-1,9	4,3	,0	-1,5	
Total	44	64	69	75	31	73	356
<i>Expected Count</i>	44,0	64,0	69,0	75,0	31,0	73,0	356,0
% within destination	12,4%	18,0%	19,4%	21,1%	8,7%	20,5%	100,0%
% within Segments	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	62,725 ^a	35	,003
Likelihood Ratio	62,687	35	,003
Linear-by-Linear Association	1,928	1	,165
N of Valid Cases	356		

a. 19 cells (39,6%) have expected count less than 5. The minimum expected count is 1,92.

East Mediterranean category is positively and significantly associated with PSB segment. Over 33% of this group is a member of PSB segment. On the other hand, a strong negative association exists with VASB. Middle East group has the strongest positive association with RS segment across all other destination groups. Considering North Africa group, the only significant relation exists with VASB segment, but the sign of relation is negative. For others group, a very significant positive association exists with VASB, but this groups is fragmented to small frequency of shipment destinations. These are the least frequent destinations from Aegean Region both in our sample and in practice.

Seaway usage rate across segments

Another descriptor nominal variable is the seaway usage frequency of shippers with a three category: All, mostly, and rarely. The six segments show variety in terms of seaway usage rate of shippers in their export shipment modes. Significant majority of shippers that use only seaway in their exports is situated in NCS segment with a rate of 25 percent. Over 60 percent of this segment also consists of all seaway shippers. There is a significant negative association between all seaway category and TS segment.

Table 48: Cross Tabulation of Seaway Usage Rate and Segments

Seaway usage rate	TCS	PSB	NCS	VASB	RS	TS	Total
All seaway	18	30	42	34	18	23	165
<i>Expected Count</i>	20,4	29,7	32,0	34,8	14,4	33,8	165,0
% within seaway rate	10,9%	18,2%	25,5%	20,6%	10,9%	13,9%	100,0%
% within Segments	40,9%	46,9%	60,9%	45,3%	58,1%	31,5%	46,3%
Adjusted Residual	-,8	,1	2,7	-,2	1,4	-2,9	
Mostly seaway	13	26	22	38	11	28	138
<i>Expected Count</i>	17,1	24,8	26,7	29,1	12,0	28,3	138,0
% within seaway rate	9,4%	18,8%	15,9%	27,5%	8,0%	20,3%	100,0%
% within Segments	29,5%	40,6%	31,9%	50,7%	35,5%	38,4%	38,8%
Adjusted Residual	-1,3	,3	-1,3	2,4	-,4	-,1	
Rarely seaway	13	8	5	3	2	22	53
<i>Expected Count</i>	6,6	9,5	10,3	11,2	4,6	10,9	53,0
% within seaway rate	24,5%	15,1%	9,4%	5,7%	3,8%	41,5%	100,0%
% within Segments	29,5%	12,5%	7,2%	4,0%	6,5%	30,1%	14,9%
Adjusted Residual	2,9	-,6	-2,0	-3,0	-1,4	4,1	
Total	44	64	69	75	31	73	356
<i>Expected Count</i>	44,0	64,0	69,0	75,0	31,0	73,0	356,0
% within seaway rate	12,4%	18,0%	19,4%	21,1%	8,7%	20,5%	100,0%
% within Segments	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	40,680 ^a	10	,000
Likelihood Ratio	40,147	10	,000
Linear-by-Linear Association	1,807	1	,179
N of Valid Cases	356		

a. 1 cells (5,6%) have expected count less than 5. The minimum expected count is 4,62.

The group that mostly uses seaway in their total exports has a significant positive relation with VASB segment. 27 percent of mostly seaway shippers are located in VASB segment by comprising 50 percent of this segment. This group, though not significant, has negative relation with TCS and NCS segments, common characteristics of which are their cost sensitiveness.

Great majority of shippers that rarely use seaway in their exports are located in TS and TCS segments. The common characteristics of these segments are their

sensitiveness to time. Over 41 percent of this group is in TS segment while over 24 percent is in TCS segment. There is also a significant negative association between rarely seaway group and NCS segment, which is insensitive to time.

Monthly container volume across segments

Monthly container volume of shippers is a vital indicator of size of customers for container lines. The largest category is 1-5 container and it is disproportionately distributed across the segments. The highest positive relation exists with TS segment with 28 percent of 1-5 category being a member of this segment. It is followed by another time sensitive (but cost sensitive too) segment, which is TCS. 17.5 percent of 1-5 category is in TCS segment. The highest negative relation exists with VASB segment, and it is followed by PSB segment. Common characteristics of these segments are their greater importance to value added services factor.

Table 49: Cross-Tabulation of Monthly Container Volume and Segments

Monthly container	TCS	PSB	NCS	VASB	RS	TS	Total
1-5	24	17	24	16	13	43	137
Expected Count	16,9	24,6	26,6	28,9	11,9	28,1	137,0
% within monthly container	17,5%	12,4%	17,5%	11,7%	9,5%	31,4%	100,0%
% within Segments	54,5%	26,6%	34,8%	21,3%	41,9%	58,9%	38,5%
Adjusted Residual	2,3	-2,2	-,7	-3,4	,4	4,0	
6-14	13	16	20	24	10	17	100
Expected Count	12,4	18,0	19,4	21,1	8,7	20,5	100,0
% within monthly container	13,0%	16,0%	20,0%	24,0%	10,0%	17,0%	100,0%
% within Segments	29,5%	25,0%	29,0%	32,0%	32,3%	23,3%	28,1%
Adjusted Residual	,2	-,6	,2	,8	,5	-1,0	
15-39	6	11	15	14	3	10	59
Expected Count	7,3	10,6	11,4	12,4	5,1	12,1	59,0
% within monthly container	10,2%	18,6%	25,4%	23,7%	5,1%	16,9%	100,0%
% within Segments	13,6%	17,2%	21,7%	18,7%	9,7%	13,7%	16,6%
Adjusted Residual	-,6	,1	1,3	,5	-1,1	-,7	
40-99	1	11	7	8	1	3	31
Expected Count	3,8	5,6	6,0	6,5	2,7	6,4	31,0
% within monthly container	3,2%	35,5%	22,6%	25,8%	3,2%	9,7%	100,0%
% within Segments	2,3%	17,2%	10,1%	10,7%	3,2%	4,1%	8,7%
Adjusted Residual	-1,6	2,7	,5	,7	-1,1	-1,6	

Table 49 (Continued)

Monthly container	TCS	PSB	NCS	VASB	RS	TS	Total
100 and more	0	9	3	13	4	0	29
Expected Count	3,6	5,2	5,6	6,1	2,5	5,9	29,0
% within monthly container	0,0%	31,0%	10,3%	44,8%	13,8%	0,0%	100,0%
% within Segments	0,0%	14,1%	4,3%	17,3%	12,9%	0,0%	8,1%
Adjusted Residual	-2,1	1,9	-1,3	3,3	1,0	-2,9	
Total	44	64	69	75	31	73	356
Expected Count	44,0	64,0	69,0	75,0	31,0	73,0	356,0
% within monthly container	12,4%	18,0%	19,4%	21,1%	8,7%	20,5%	100,0%
% within Segments	100,0 %	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%

Chi-Square Tests			
	Value	df	Asymp. Sig. (2- sided)
Pearson Chi-Square	56,422 ^a	20	,000
Likelihood Ratio	64,171	20	,000
Linear-by-Linear Association	3,287	1	,070
N of Valid Cases	356		

a. 4 cells (13,3%) have expected count less than 5. The minimum expected count is 2,53.

The categories of 6-14 and 15-39 are not significantly associated with any of the segments. Though it is worth to mention that 24 percent of 6-14 category is under VASB segment while 25 percent of 15-39 category is located in NCS segment. The highest percentage of 40-99 category at a single cell occurs with PSB segment. It is also significantly associated. 35 percent of this category is located in PCB segment.

Companies with 100 and more containers have significant positive relation with VASB segment. However, members of this category have significant negative relation with the segments of TCS and TS segments. This situation is exactly the opposite of 1-5 category, which has negative positive relation with time sensitive segments and negative relation with value added service buyers. These two edges of monthly container, very small and very large shippers, show negative associations in terms of segment membership.

No of employee across segments

First of all, it is of importance to mention that no relationship exists between the monthly container volume and number of employees. The number of employees does not increase as the number of container increases. Many industries may require high number of workforce due to complex production procedure, but the output may not be very large in terms of size. So number of employee should not read as volume of company.

Table 50: Cross-Tabulation of No of Employee and Segments

No of employee	TCS	PSB	NCS	VASB	RS	TS	Total
1-9	5	10	20	8	2	10	55
<i>Expected Count</i>	6,8	9,9	10,7	11,6	4,8	11,3	55,0
% within no of employee	9,1%	18,2%	36,4%	14,5%	3,6%	18,2%	100,0%
% within Segments	11,4%	15,6%	29,0%	10,7%	6,5%	13,7%	15,4%
Adjusted Residual	-,8	,0	3,5	-1,3	-1,5	-,5	
10-49	18	10	20	22	7	28	105
<i>Expected Count</i>	13,0	18,9	20,4	22,1	9,1	21,5	105,0
% within no of employee	17,1%	9,5%	19,0%	21,0%	6,7%	26,7%	100,0%
% within Segments	40,9%	15,6%	29,0%	29,3%	22,6%	38,4%	29,5%
Adjusted Residual	1,8	-2,7	-,1	,0	-,9	1,9	
50-249	17	31	21	32	8	30	139
<i>Expected Count</i>	17,2	25,0	26,9	29,3	12,1	28,5	139,0
% within no of employee	12,2%	22,3%	15,1%	23,0%	5,8%	21,6%	100,0%
% within Segments	38,6%	48,4%	30,4%	42,7%	25,8%	41,1%	39,0%
Adjusted Residual	-,1	1,7	-1,6	,7	-1,6	,4	
250 and more	4	13	8	13	14	5	57
<i>Expected Count</i>	7,0	10,2	11,0	12,0	5,0	11,7	57,0
% within no of employee	7,0%	22,8%	14,0%	22,8%	24,6%	8,8%	100,0%
% within Segments	9,1%	20,3%	11,6%	17,3%	45,2%	6,8%	16,0%
Adjusted Residual	-1,3	1,0	-1,1	,4	4,6	-2,4	
Total	44	64	69	75	31	73	356
<i>Expected Count</i>	44,0	64,0	69,0	75,0	31,0	73,0	356,0
% within no of employee	12,4%	18,0%	19,4%	21,1%	8,7%	20,5%	100,0%
% within Segments	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	47,848 ^a	15	,000
Likelihood Ratio	43,371	15	,000
Linear-by-Linear Association	,066	1	,797
N of Valid Cases	356		

a. 2 cells (8,3%) have expected count less than 5. The minimum expected count is 4,79.

Considering the categories of number of employee, the highest association is witnessed between 250 and more category and RS segment. At the same time, this category has the highest negative association with TS segment. 1-9 category, on the other hand, has significant positive relation with NCS segment. Though not statistically significant, 10-49 category has a large positive association with TS segment considering the difference between actual and expected counts.

Delivery terms across the segments.

Shippers were asked to choose their most frequently used delivery term group in their exports. FOB &FAS group has significant positive relation with TCS and NCS segments. These two segments are both sensitive to time. On the other hand, FOB & FAS group has a high negative relation with PSB segment. Although CFR & CIF group does not have a significant association with any of the segments, the highest positive adjusted residual score is coincided with PSB segment. On the other hand, DAP & DDP group has a significant positive relation with PSB segment. Over 31 percent of this group is located in PSB segment. This group has also negative association with NCS segment.

Table 51: Cross-Tabulation of Delivery Terms and Segments

Delivery Term	TCS	PSB	NCS	VASB	RS	TS	Total
FOB & FAS	29	17	43	32	17	43	181
<i>Expected Count</i>	22,4	32,5	35,1	38,1	15,8	37,1	181,0
% within delivery terms	16,0%	9,4%	23,8%	17,7%	9,4%	23,8%	100,0%
% within Segments	65,9%	26,6%	62,3%	42,7%	54,8%	58,9%	50,8%
Adjusted Residual	2,1	-4,3	2,1	-1,6	,5	1,5	
CFR & CIF	9	23	17	23	10	17	99
<i>Expected Count</i>	12,2	17,8	19,2	20,9	8,6	20,3	99,0
% within delivery terms	9,1%	23,2%	17,2%	23,2%	10,1%	17,2%	100,0%
% within Segments	20,5%	35,9%	24,6%	30,7%	32,3%	23,3%	27,8%
Adjusted Residual	-1,2	1,6	-,7	,6	,6	-1,0	
DAP & DDP	6	24	9	20	4	13	76
<i>Expected Count</i>	9,4	13,7	14,7	16,0	6,6	15,6	76,0
% within delivery terms	7,9%	31,6%	11,8%	26,3%	5,3%	17,1%	100,0%
% within Segments	13,6%	37,5%	13,0%	26,7%	12,9%	17,8%	21,3%
Adjusted Residual	-1,3	3,5	-1,9	1,3	-1,2	-,8	
Total	44	64	69	75	31	73	356
<i>Expected Count</i>	44,0	64,0	69,0	75,0	31,0	73,0	356,0
% within delivery_terms	12,4%	18,0%	19,4%	21,1%	8,7%	20,5%	100,0%
% within Segments	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%

Metric Descriptors of Segments

There are three types of metric descriptor variables: Sensitivity of cargo, competition level of shippers, and willingness of shippers to pay more. One-way ANOVA analysis is conducted to check if these metric descriptors differ statistically significant across the segments. Table 52 indicates that the three descriptors show statistical differences across the segments.

Table 52: One-way ANOVA Test between Segment Membership and the Metric Descriptors

		Sum of squares	Df	Mean square	F	Sig
Cargo Sensitiveness	Between Groups	30,765	5	6,153	6,642	,000
	Within Groups	324,235	350	,926		
	Total	355,000	355			
Perceived competition level	Between Groups	23,277	5	4,655	4,912	,000
	Within Groups	331,723	350	,948		
	Total	355,000	355			

Cargo sensitiveness

Cargo sensitiveness is a metric measure consisting of combination of three variables: Sensitiveness to smell, dirtiness, and wetness. This is an effective indicator to know how sensitiveness of cargoes changes between the segments. By considering the cargo sensitivity, container lines may have some clues about the segment membership of a shipper.

Table 53: Factor Score Means of Cargo Sensitiveness across Segments

Sensitiveness*	Time-sensitive cost seekers	Pragmatic service buyers	Non-urgent cost seekers	VAS buyers	Relationship seekers	Time seekers
Factor Score	,33758	-,18838	-,40301	,05943	-,22652	,37774
Factor Mean	4,70	4,06	3,80	4,32	4,02	4,78

*Five-point scale

Based on the Table 53, the most sensitive segments are the time seekers and time-sensitive cost seekers. Non-urgent cost seekers, on the other hand, has the lowest cargo sensitiveness score among all segments. The second lowest cargo sensitiveness score belongs to relationship seekers segment.

Perceived competition level of shippers across segments

Perceived competition level may significantly influence the decision of shippers. Our scale consists of three items. According to the results, VAS buyers segment has the highest score on competition level in the market which is followed by pragmatic service buyers and non-urgent seekers. The lowest perceived competition level belongs to the segment of time seekers. The second lowest score of competition level belongs to time-sensitive cost seekers.

Table 54: Factor Score Means of Perceived Competition across Segments

Competition level*	Time-sensitive cost seekers	Pragmatic service buyers	Non-urgent cost seekers	VAS buyers	Relationship seekers	Time seekers
Factor score	-,14918	,10829	,10477	,29499	,07569	-,43927
Factor mean	3,74	3,99	3,97	4,11	3,85	3,56

*Five-point scale

4.2.2.6 Criterion Validity of Segments

After interpreting each of the six segments, the next step is to provide validation of the segments. Validation of a cluster solution can be assessed generally in two ways. One of them is to use a second sample for clustering (holdout sample) and compare the results of the real sample and holdout sample (Ketchen and Shook, 1996). However, it is not possible in most of the studies, including this dissertation, reckoning the cost, time, and other difficulties to reach a second sample. Moreover, it is also not very logical as many strategic groups can be industry-specific, which makes it difficult to generalize the results (Ketchen and Shook, 1996).

The second approach to validate the results is criterion validity as suggested by several authors (Hair et al., 2014; Ketchen and Shook, 1996; Sarstedt and Mooi, 2014; Tonks, 2009). Criterion validity is performed by assessing the variables which are not used for clustering but should be related to cluster memberships. Sarstedt and Mooi (2014) state that the criterion validity can be achieved if significant differences are observed between dependent variables across the segments. Tonks (2009) analyze the validity and design issues of market segmentation studies, and indicated the superiority of criterion validity as in the below quotation when evaluating construct, content, and criterion validity (Pg. 350):

“For the practicing marketing manager, erudite debates concerning construct and content validity and the role of subjectivity may be considered irrelevant if a given general segmentation variable has adequate criterion validity. Of the three types of validity identified here, it is criterion validity which is the most obvious, which is likely to be seen

as immediately pragmatic and which determines some of the criteria for segment qualification and segment attractiveness”.

Ketchen and Shook (1996) also evaluated several reliability and validity approaches and claimed that criterion validity is superior to the other approaches. In this regard, validation of the segments in this study is ensured using the criterion validity as suggested by Hair et al. (2014) and Sarstedt and Mooi (2014). Malhotra and Birks (2007) indicate that if the criterion validity questions are accompanied to the same survey that main results are achieved, then it is called as concurrent criterion validity. This study, as explained in the methodology chapter, included the criterion validity questions to the survey together with selection criteria questions.

Although the selection criteria factors were not known in advance, it was anticipated that some factors would emerge considering time, cost, relations, and value added services. Based on these criteria, several hypotheses were developed. Some correlations and associations are expected between criterion validity variables and clustering factors (selection criteria). Since segments are created based on the clustering variables, eventually significant associations are expected between the segments and criterion validity variables. Some of the nominal descriptors and metric descriptors are used for the criterion validity.

The first criterion validity factor is cargo sensitiveness. From the practice and based on the interviews, it is well known that the more sensitive the cargo the more time-sensitive the cargo owner (shipper) is. Thus, a positive correlation is expected between shippers' score on cargo sensitiveness factor and time factor. As shown in Table 55, there is a significant correlation between the two. Thus, we expect cargo sensitiveness to be significantly higher in segment which value time higher than other segments.

Table 55: Correlation Results between Criterion Validity and Selection Factors

		VAS	Responsive- ness	Cost	Time	Relational
Cargo	Pearson Correlation	-,080	-,029	-,094	,438**	,037
sensitiveness	Sig. (2-tailed)	,134	,584	,077	,000	,485
	N	356	356	356	356	356
Competition	Pearson Correlation	,328**	,097	,136*	-,082	,128*
level	Sig. (2-tailed)	,000	,067	,010	,124	,015
	N	356	356	356	356	356

**Correlation is significant at the 0.01level (2-tailed)

*Correlation is significant at the 0.05 level (2-tailed)

The two segments which have high scores on time factor are TCS and TS. Considering cargo sensitiveness of the segments, these two segments have also the highest scores on sensitiveness. This is coherent with theory and practice.

Menon et al. (1998) found that competition level significantly affects the relative importance given to selection criteria. In their study, customer service related variables were positively correlated positively with the environmental competitive hostility. The price had no significant correlation with a score of 0.173. In this dissertation, importance given to cost and competition level have positive significant correlation but the correlation degree is not strong (0.136). In our study, competitive environment is highly and positively correlated with value added services. It means that the shipper who think competition in their market is fiercer attach more importance to value added services. In the time where many industries are becoming commodity-like industries (Balci et al., 2018), it is quite normal that shippers in more competitive markets score higher on value added services to make differentiation in logistics to achieve benefit with their customer relations. Consistently, the two segments that attach higher importance to value added services (VASB and RS) also score higher on perceived competition level than the other segments.

Several nominal descriptors also contribute for proving criterion validity. Cargo value is one of them. It is well known in practice that low value cargoes pay more attention to cost rather than time and vice versa. This has been proven in the study of Pedersen and Gray (1998), who has indicated that the time becomes more important than price as the value per ton increases. Considering the cross table of

cargo value and segments, a positive significant association exists between low value category and NCS segment, which has very high score on cost factor. In parallel, a negative significant association exists between low value category and time seeker segment. Similarly, high value cargo category also has a negative association with NCS segment. All of these are coherent with the study of Pedersen and Gray (1998) as well as the practice.

Though no previous research is detected to illustrate association between cargo value and importance attached to value added services, it is known in practice that high value cargoes attach more importance to value added services than the low value cargoes. The higher value cargoes seek for extra services such as traceability of cargo and door-to-door services. In accordance, VASB segment has significant positive relation with high value cargo category and significant negative association with low value category.

There is also some support from industry of shippers for the criterion validity. For instance, minerals category, which are usually low value and in-sensitive raw materials, has very high significant positive relation with NCS segment, but negative relation with TS segments. These two are the opposite of each other in terms of time and cost. The first is cost seekers while the latter is time seeker. Thus, the association is coherent with the practice. Machine industry and refrigerated food industry, which usually have high value sensitivity and value, are significantly and positively associated with time seeker segment. Fashion industry, which usually requires just-in-time services with high tracking capabilities, is significantly and positively associated with VASB.

Akin to industry of shippers, ICB categories also illustrate rational distribution regarding theory and practice. Basic materials, which usually consist of mostly non-sensitive and low value cargoes, are positively associated with NCS segment and negatively with TS. In practice, it is known that block marble shippers or chrome shippers are mostly focused on price rather than time. Industrials, which are usually spare parts or production capitals like machinery, are sensitive to time in practice. This is coherent in our findings that this category is positively associated with time seeker segment. Consumer goods, on the other hand, show actually great variety in practice that some of them are highly sensitive to time such as temperature

control foods but some of them are not much sensitive such as dried foods (spices, herbs, olive oil etc.).

Another nominal descriptor to be used as criterion validity is seaway usage frequency of shippers. In practice, it is acknowledged that the more urgent cargoes usually prefer other modes such as road and air mostly. Yet, these can still use seaway in some of their shipments. Thus, it can be concluded that the importance of time increases as the seaway usage decreases. It is shown in the cross tabulation between seaway usage rate and segment membership that “rarely seaway” category is positively and significantly associated with time sensitive segments (TCS and TS). On the other hand, “all seaway” category has positive relation with NCS but negative relation with TS segment. This distribution of respondents across segments also provides support for the criterion validity.

As shown in previous part, there exists more significant associations between the nominal descriptors and segments such as monthly volume of containers, delivery terms, no of employee, and destination region. However, these are not utilized in criterion validity because no certain theoretical and practical groundings is applicable. Although rational implications and logical groundings exist in terms of theory and practice, these are given in discussion part since they are based on interpretations.

Considering the coherence between container market segments in Aegean Region and theoretical and practical groundings, criterion validity is regarded to be achieved. Upon ensuring criterion validity of the segments, the next step in the dissertation is to give detailed characteristics of each segment one by one based on the descriptors.

4.2.2.7 Main characteristics of container shipper segments in Aegean Region

In this part, each segment is described considering the characteristics of them. In addition to explanation of each nominal descriptor’s distribution across segments, it is also necessary to briefly explain each segment, especially through pointing out their leading characteristics. It is especially of critical importance to highlight the

shippers' firmographics and their products' characteristics which have significant associations with a specific segment. Table 56 is created to illustrate these significant positive and negative associations. It also shows the average ranking of each segment in competition level and cargo sensitiveness.

When describing the segments in the text, “*” sign will be attached to some nominal categories. This means that it is significantly associated with that segment. The reason why this significant association is underlined is because of the imbalanced numbers of categories. For instance, below, number of dry foods in TCS segment is higher than chemicals and plastics. Yet, chemicals and plastics has a positive significant association while dry foods does not. It implies that it is very likely that if number of total chemicals & plastics and dry food industries were equal, then the number of chemicals & plastics would have been more than dry food in TCS segment. Thus, the leading industry in this segment, in fact, is chemicals & plastics industry instead of dry foods.

Table 56: Summary of Associations between Segment Membership and Demographics

	Time-sensitive cost seeker	Pragmatic service buyers	Non-urgent cost seekers	Value-added service buyers	Relationship seekers	Time seekers
Industry	Chemicals & plastics ¹	Machine ²	Minerals ¹ / Refrigerated food ²	Fashion ¹ / Machine ²	Textile ¹	Machine and Ref. food ¹ / Minerals ²
ICB			Basic Materials ¹ / Consumer ²			Industrials ¹ / Basic materials ²
Cargo Value			Low value ¹ / High value ²	High value ¹ / Low value ²	Medium value ¹	Medium value ¹ / Low value ²
Destination	North Europe ¹	East Mediterranean ¹	North America ¹ / North Europe ²	North Africa and East Mediter. ²	Middle East ¹ / North Europe ²	
Seaway usage	Rarely ¹		All ¹ / Rarely ²	Mostly ¹ / Rarely ²		Rarely ¹ / All ²
Monthly container	1-5 ¹ / 100 and more ²	40-99 ¹ / 1-5 ²		100 and more ¹ / 1-5 ²		1-5 ¹ / 100 and more ²
No of Employee		10-49 ²	1-9 ¹		250 and more ¹	250 and more ²
Delivery terms	FOB & FAS ¹	DAP & DDP ¹ / FAS & FOB ²	FOB & FAS ¹ / DAP & DDP ²			
Cargo sensitive-ness Rank	2 nd	4 th	6 th	3 rd	5 th	1 st
Competition level Rank	5 th	2 nd	3 rd	1 st	4 th	6 th

¹ Significant positive association at 0.05 level

² Significant negative association at 0.05 level

Time-sensitive cost seekers

This segment has two prominent characteristics in terms of selection criteria factors: Its sensitivity to time and cost factors. This segment has also relatively lower score on value added services and relational factors than other segments. The largest industry members of this segment are dry foods (22,7%) and chemicals & plastics* (18,2%). The smallest industry member of this segment is tiles & ceramics. ICB categories – basic materials, industrials, and consumers – are almost evenly distributed in this segment. Low value cargoes are the leading category in TCS segment, though not statistically significant. The leading industry in this segment is North Europe*. The prominent seaway usage categories in this segment are all seaway (40%) and rarely* (29,5%).

54,5 percent of shippers in this segment ship 1-5* containers per month. The second largest category in this segment is 6-14 containers (29,5%). Thus, 85 percent of shippers in this segment ship less than 14 containers a month. The smallest and negatively significant members of this segment are shippers that load 100 and more* containers. In terms of number of employee, largest member of this segment is 10-49 employees. Leading delivery term in this segment is FOB & FAS* (65,9%). Cargo sensitiveness score of this segment is 4,70 out of 5, which is the second highest sensitiveness score across segments. Competition level perceived in this segment (3,74 out of 5) is lower than other segments (fifth among all segments).

Considering the main characteristics of this segment, especially the significant associations, if a shipper is from chemicals & plastics or dry food industries, mostly ships to North Europe, ships around 1-5 containers per month, and has a sensitive cargo, then it is a very high chance that the shipper is a potential member of TCS segment.

Pragmatic service buyers

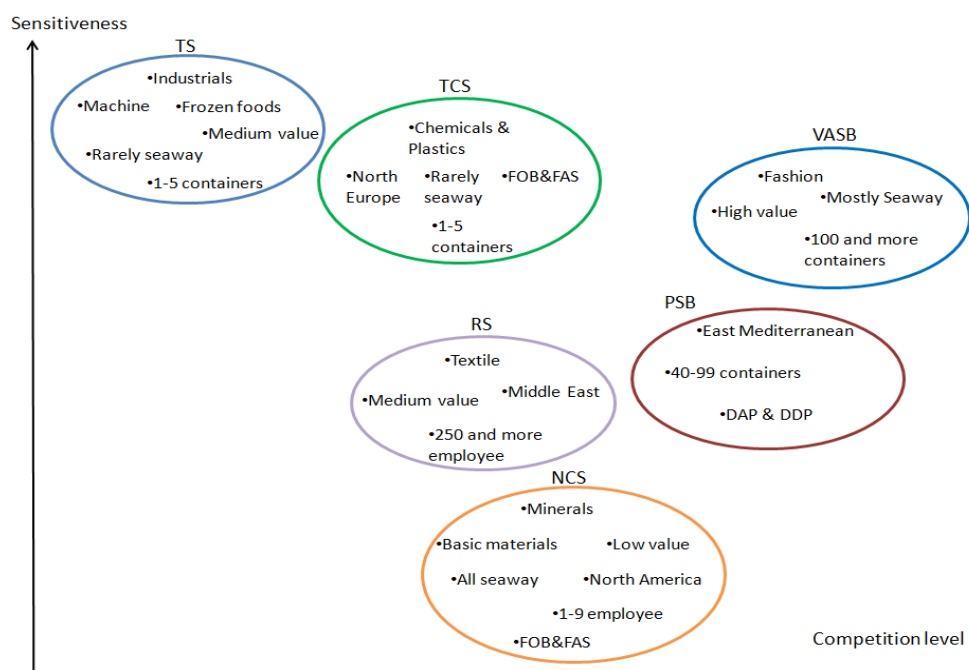
This segment has the lowest average score on relational factor and has above average scores on VAS and responsiveness factor. Importance of cost and time is near average levels comparing all the segments. One of the most distinguishing

descriptors of this segment is its association with payment terms. 37,5 percent of this segment consists of DAP & DDP* shippers with a very high adjusted residual score (3.5). This segment has a high negative association with FOB & FAS* delivery term, which is consistent because DAP and FOB delivery terms are just the opposites of each other regarding the distribution of shipment responsibilities between the exporter and importer.

Another strong characteristic of this segment is its positive association with large volume shippers (40-99*, 100 and more), and negative association with small shippers (1-5*). Moreover, East Mediterranean* shippers are positively associated with this segment. Machine* shippers, on the other hand, are negatively associated with this segment. PSB segment does not have extreme scores in sensitiveness (4th among six clusters) or in perceived competition level (3rd among 6 clusters).

Taking the characteristics of PSB into consideration, it can be said that, if a shipper has a large container volume shipments (over 40 per month), ships mostly by DAP&DDP terms, and mostly ships to East Mediterranean, then it is likely that the shipper is a member of PSB segment.

Figure 21: Positively Associated Descriptors of Segments and Their Position in Competition Level & Sensitiveness Axis



Non-urgent cost seekers

This segment distinguishes with its higher score on cost and lower score on time comparing to other segments. This segment gives more importance on relational and less importance to VAS factors based on the average of all segments. This segment has more significant descriptors comparing to the previous two segments. It has either positive or negative significant associations with all the descriptors.

In terms of the industry of shippers, the prominent industry in this segment is minerals* (37,7% of the segment). Refrigerated foods category is one of the smallest members (3,3% of segment) but also negatively associated industry with this segment. In consistent, this segment is positively associated with basic materials* (52% of segment) and negatively associated with consumer products* (21% of segment). Coherently, low value cargoes* (46% of segment) are the leading category in terms of value of cargo. High value cargoes* are the smallest members (8% of segment) of this segment regarding cargo value.

The leading destination of this segment is North America* (25% of segment). North Europe, on the other hand, is negatively associated with this segment (only 11 of 90 North Europe shippers fall into this segment). Great majority of shippers in this segment (60%) ships all* of their cargoes by seaway. In consistent, rarely seaway category*, has negative relation with this segment, and only comprises 7 percent of the segment. This segment is also positively associated with 1-9 employees category. This is probably because many block marble shippers are not the producers but trading companies selling the marbles on behalf of them. This is also a limitation of study as no question asked whether a shipper is trader or producer. Future study should ask this question as well.

Regarding the mostly preferred delivery terms, FOB & FAS* has positive relation while CFR & CIF* has negative relation. This segment also has the lowest sensitivity score (3,80). If a shipper's industry is mineral, cargo value is low, mostly ships to North America, mostly prefers FOB & FAS terms, has 1-9 employees in the company, then it is a high chance that the shipper is a member of NCS segment.

Value-added service buyers

The shippers in this segment give the highest score on value added services comparing shippers in other segments. Responsiveness score is less than the average, but it should be kept in mind that all the segments score higher than 6 out of 7 considering the factor means. This segment also scores higher on relational factor than the average of all segments. Fashion* has the highest significant positive association with VASB segment. Although it represents only 10% of the segment, almost a half of the fashion shippers are located in this segment. Around 21 percent of this segment consists of dry food, with expected count almost equals to actual count. Tiles & ceramics comprises around 16 percent of this segment, but actual count, though not significantly, larger than the expected count. This segment has a negative relation with machine* industry.

Almost a half of this segment is consumer product shippers and around 18 percent is basic materials. Although the relation is not significant, the first one has a positive and the latter has a negative relation with this segment. VASB segment has a very high positive association with high value* cargoes, and consistently, has a negative relation with low value* cargoes. The expected count of high value in this segment is 15 but the actual count is 27. In terms of destination, almost 30 percent of shippers send their cargoes mostly to Europe, though not significant the sign is positive. This segment is negatively associated with East Med.* and North Africa* destinations.

Over 50 percent of the shippers in this segment are from category of mostly* seaway mode. Rarely seaway* category, on the other hand has negative association and generate only 4 percent of this segment. One of the most effective descriptors of this segment is its association with monthly container volume. This segment has a high positive relation with shippers that load 100 and more* containers per month. Almost a half of 100 and more category is located in this segment. Coherently, this segment has a negative association with 1-5* containers per month category. Although not significant, the sign of association is positive with DAP & DDP category and negative with FOB & FAS category. Over a quarter of DAP & DDP category is located in this segment.

Considering the characteristics of this segment, if a shipper is from fashion or maybe tiles & ceramics, has high value of product, ships 100 or more containers, and prefers mostly seaway mode, then it is a very high chance that this shipper is a member of VASB segment.

Relationship seekers

This is the smallest segment which scores the relational factor higher than the other segments. RS segment give higher importance to VAS and responsiveness factors more than the average of all segments. Cost and time, which are the core elements of container shipping service, are scored lower than the average of all segments. Textile* industry is positively associated with this segment. A quarter of this industry is located here. Minerals, machine, and refrigerated food has substantial negative association, though it is not significant. Dry foods, on the other hand, have substantial positive relation. Regarding ICB categories, no significant association exists, but consumers are considered to have substantial positive relation with this segment.

Medium value* cargo category is positively related with RS segment by comprising almost 75 percent of the segment. Middle East* shipments has positive association with this segment and generates 30 percent of the segment. On the other hand, North Europe* shipments have negative relation with this segment generating less than 10 percent of the segment. No significant association exists for seaway usage frequency, but all seaway category, comprising over 50 percent of this segment, has high positive relation while rarely seaway category has negative relation. 250 and more employees* category is positively associated with RS segment. Although the expected count in this segment is 5, total 14 shippers are located in this segment.

It is very likely that shippers with a medium value of cargo, mostly shipping to Middle East, from the industries of textile or dry foods, and employing more than 250 people in their companies are highly potential members of relation seekers segment.

Time seekers

This segment's members have the highest score on time factor, and relatively higher than average on responsiveness and relational factor. Importance attached to VAS and cost factors are below average of segments. The leading, and also very obvious, industries of this segment are machine* and refrigerated foods*. Over 50 percent of machine shippers and almost 50 percent of refrigerated food shippers are positioned in this segment. Minerals* have negative association with this segment and only 1 shipper from this category is located in TS segment. In terms of ICB categories, industrial goods* are the leading category that generates almost a half of this segment. In consistent, basic materials* has a negative association.

Generating almost 70 percent of this segment, medium value* products are the major category in terms of cargo value. Low value* products, on the other hand, have negative relation with this segment. None of the destinations have significant relation with this segment. In regard to seaway usage rate, this segment is positively related with rarely seaway* category, and in parallel, negatively related with all seaway* category. 1-5 shipments* per month category is the leading one in this segment regarding monthly volume of containers. Coherently, this segment is negatively associated with 100 and more* container shipments per month category. It is also negatively related with the category of 250 and more employees*.

In summary, this time sensitive segment can be a potential location of shippers who are from machine or refrigerated industries, whose cargo value is medium level, and ships around 1-5 containers per month.

4.2.3 Summary of Quantitative Research

The quantitative segmentation research of this thesis adopts a post-hoc approach to explore the benefit segments of container shipping market in Aegean Region. The research covers several steps including EFA and CFA for selection criteria measurement development, cluster analysis for discovering the segments, One-way ANOVA analysis to test if the segments are differentiable, cross tabulation to explore the significant associations between the segments and descriptor variables, and criterion validation to ensure validity.

Container line selection criteria of shippers are used as segmentation base to apply benefit segmentation. Case-based standardization of selection criteria factors is applied to have more differentiable segments. The segmentation analysis reveals total six segments. The names of the segments are: “Time-sensitive Cost Seekers, Pragmatic Service Buyers, Non-urgent Costs Seekers, Value-added Service Buyers, Relationship Seekers, and Time Seekers. The minimum number of segment group is 31, and considering the fact that our sample represents less than 10 percent of the total exporters in Aegean Region, the segments found in this research are substantial. The segments are also differentiable in terms of selection criteria factors.

Significant associations between the segment membership and descriptors are determined. These descriptors are industry of shippers, ICB category of products, value of products, monthly container volume of shippers, seaway usage rate of shippers, most frequent destination of shippers, most preferred delivery of shippers, and no of employee of shippers. Some segments are more identifiable than other segments. The more identifiable segments are “Non-urgent Cost Seekers”, “Time Seekers”, “Time-sensitive Cost Seekers” and “Value-added Service Buyers”. The two other segments, “Pragmatic Service Buyers” and “Relationship Seekers”, are more difficult to identify.

Criterion validity of shippers are ensured by checking the correlation analysis. The metric criterion validity factors are cargo sensitiveness and perceived market competitiveness of shippers. Although these two factors are not included in the segmentation analysis, they differ significantly between the segments. In addition, many nominal descriptors show significant associations that are supposed to exist in practice as well. As far as the literature review is concerned, this research is the first one that discusses criterion validity issue. This includes both the literature of freight transport, general B2B, and passenger transport studies.

Overall, the quantitative analysis has explored a total of six segments. These segments are differentiable in terms of benefit they seek from a container shipping company. The segments also have several significant descriptors which are both theoretically and practically logical.

4.3. TESTING THE SEGMENTATION APPLICATIONS OF CONTAINER LINES IN AEGEAN REGION

In this section, the practical segmentation applications of container lines in Aegean Region– discovered in the qualitative study – will be investigated. The main research question to test the segmentation applications of container lines in the region is whether the selection criteria scores (benefits sought) of shippers differ significantly among the bases that are used by the container lines. The customers should respond different to service attributes of container shipping depending on their segments, which are created through the segmentation bases.

The segmentation approach of container lines in practice is a-priori that they segment the market through readily available characteristics of shippers such as industry and container type. This is different than the post-hoc approach segmentation analysis in the previous section (4.2) of this dissertation. In the post-hoc approach, the segments are determined based on the customers' responses on service attributes. In that analysis, all of the five selection criteria factors differ significantly from each other. In this section, it is tested if the segments used by container lines in practice are significantly different than each other or not. The bases are destination region, industry of shipper, customer size (container volume), and container type. One-way ANOVA is used to test if statistically significant differences exist between the sub-groups of these segmentation bases.

The first test is conducted for customer size which is the most preferred segmentation base in practice in Aegean Region. The Table 57 illustrates if the differences between sub-groups of customer size (monthly container volume) are witnessed or not. According to the results, responsiveness and cost are not statistically different across the sub-groups. Time and relational factors are statistically different at significance level of 0.05, but they are not different at significance level of 0.01. Only 1 variable, Value added services, is statistically different across segments at the significance level of 0.01. Larger shipper groups, “40-99” and “100 and more” attach more importance to value added services.

Table 57: One-way ANOVA Analysis Results of Monthly Container

		ANOVA				
		Sum of Squares	df	Mean Square	F	Sig.
Value added services	Between Groups	41,765	4	10,441	11,700	,000
	Within Groups	313,235	351	,892		
	Total	355,000	355			
Responsiveness	Between Groups	6,166	4	1,541	1,551	,187
	Within Groups	348,834	351	,994		
	Total	355,000	355			
Cost	Between Groups	3,738	4	,934	,934	,444
	Within Groups	351,262	351	1,001		
	Total	355,000	355			
Time	Between Groups	13,053	4	3,263	3,350	,010
	Within Groups	341,947	351	,974		
	Total	355,000	355			
Relational	Between Groups	14,744	4	3,686	3,802	,005
	Within Groups	340,256	351	,969		
	Total	355,000	355			

The second most common segmentation base is destination region. The Table 58 demonstrates that only two factors, VAS and responsiveness, are statistically different ($P < 0.05$ significance level) among the sub-groups of destination region. Cost, time, and relational factors do not significantly differ across the destination regions. The VAS and responsiveness factors, on the other hand, are not statistically different across the groups at significance level of 0.01. As a result, none of the factors are statistically different at this significance level.

Table 58: One-way ANOVA Analysis Results of Destination Region

		ANOVA				
		Sum of Squares	df	Mean Square	F	Sig.
Value added services	Between Groups	21,408	7	3,058	3,190	,003
	Within Groups	333,592	348	,959		
	Total	355,000	355			
Responsiveness	Between Groups	15,571	7	2,224	2,281	,028
	Within Groups	339,429	348	,975		
	Total	355,000	355			
Cost	Between Groups	4,718	7	,674	,670	,698
	Within Groups	350,282	348	1,007		
	Total	355,000	355			
Time	Between Groups	8,069	7	1,153	1,156	,327

	Within Groups	346,931	348	,997		
	Total	355,000	355			
	Between Groups	6,424	7	,918	,916	,494
Relational	Within Groups	348,576	348	1,002		
	Total	355,000	355			

Container type is another base used by the container lines to segment the market. The Table 59 illustrates that none of the selection criteria factors is statistically significant.

Table 59: One-way ANOVA Analysis Results of Container Type

		ANOVA				
		Sum of Squares	df	Mean Square	F	Sig.
Value added services	Between Groups	2,875	2	1,437	1,441	,238
	Within Groups	352,125	353	,998		
	Total	355,000	355			
Responsiveness	Between Groups	,553	2	,276	,275	,760
	Within Groups	354,447	353	1,004		
	Total	355,000	355			
Cost	Between Groups	1,260	2	,630	,629	,534
	Within Groups	353,740	353	1,002		
	Total	355,000	355			
Time	Between Groups	2,173	2	1,086	1,087	,338
	Within Groups	352,827	353	1,000		
	Total	355,000	355			
Relational	Between Groups	,520	2	,260	,259	,772
	Within Groups	354,480	353	1,004		
	Total	355,000	355			

Finally, industry of shipper is analyzed. All of the variables are statistically different ($P < 0.05$ significant level) between the sub-groups of industry of shipper. This is the only base that all variables are different among the groups. On the other hand, relational factor is the only variable that is not statistically different at significant level of 0.01.

Table 60: One-way ANOVA Analysis of Results of Industry of Shippers

		ANOVA				
		Sum of Squares	df	Mean Square	F	Sig.
Value added services	Between Groups	26,366	9	2,930	3,084	,001
	Within Groups	328,634	346	,950		
	Total	355,000	355			
Responsiveness	Between Groups	25,256	9	2,806	2,945	,002
	Within Groups	329,744	346	,953		
	Total	355,000	355			
Cost	Between Groups	28,505	9	3,167	3,356	,001
	Within Groups	326,495	346	,944		
	Total	355,000	355			
Time	Between Groups	49,088	9	5,454	6,169	,000
	Within Groups	305,912	346	,884		
	Total	355,000	355			
Relational	Between Groups	20,878	9	2,320	2,402	,012
	Within Groups	334,122	346	,966		
	Total	355,000	355			

The results of the ANOVA in this section indicate that the most common bases used by container lines in the qualitative study do not really reflect the customers' differences as effective as the six post-hoc segments. This is not very surprising as the main goals of using these bases, company size and destination region, are rather for strategic and operational purposes instead of revealing distinct needs and wants of customers. As discussed in the qualitative study, company size is usually used for allocating marketing resources in accordance with the size of customer. By evaluating the size of customer, the level of marketing offering, including the price and other benefits for customers, is customized for larger customers. Destination region is actually used for operational smoothness. However, segmenting the market based on destination region by adopting a-priori approach does not necessarily create groups that have distinct characteristics.

Although the industry of shippers is the only preferred by three of the container lines, it actually mirrors well the differences of shippers considering their scores to container line selection criteria factors. If a-priori segmentation is preferred by the lines, which is the case in our qualitative research, and if their purpose is to

reveal distinct needs of customer (which is the main purpose of segmenting), then industry of shippers should definitely be given place in the segmentation program.

Compared to the a-priori segmentation applications of container lines in Izmir, the post-hoc approach applied in this dissertation creates segments that are more distinctive than each other in terms of benefits sought by shippers. All of the selection criteria factors are statistically different between the benefit segments at a significance level of $P < 0.000$. This allows containers lines to differentiate their marketing programs for each segment and take an action to each segment separately.



DISCUSSION

This dissertation has first applied a qualitative research to explore market segmentation applications of container lines located in Izmir; conducted a quantitative research on container shippers in Aegean Region of Turkey to discover benefits segments and their characteristics; and tested if segment bases used by container lines in Izmir are distinctive in terms of selection criteria, or benefits in other terms.

Based on the qualitative study, it is observed that the container lines adopt a-priori approach when segmenting their markets. The segmentation bases used by the lines are the type of customer, the size of customer, destination region, container type, the loyalty of customers, decision maker, and the industry of shippers. According to the interviews with managers of container lines, other potential bases that can be utilized are seasonality of shipments, decision maker, cargo characteristics, and whether the shipment is export/import. The majority of the bases suggested here were used in container shipping literature as well. Loyalty was used by Maloni *et al.* (2016); customer type and cargo characteristics were used by Collison (1984); customer size was used by Collison (1984) and Wen and Lin (2015); and destination region (route) was utilized by Matear and Gray (1995).

The interviews in qualitative research suggest that the benefits of market segmentation in container shipping are various. Basic ones are: determining specific needs and wants of different customer groups, managing high volume customers effectively, adopting effective sales and customer service organization, training new marketing personnel, developing new services and improving existing ones, exploring new and profitable customers, and using marketing resources more efficiently. These benefits are parallel to segmentation literature (Assael, 1993; Boyt and Harvey, 1997; Dibb, 1998; Kotler and Armstrong, 2010; Ranganet *al.*, 1992; Weinstein, 2013), except “training new personnel”, which is mentioned for the first time based on our literature review.

The results of qualitative study indicate that majority of middle and small sized container lines in Izmir do not use market segmentation in a systematic way. This result is coherent with B2B segmentation literature which remarks the gap

between academic papers and practice in use (Freytag and Clarke, 2001; Boejgaard and Ellegard, 2010). The bases preferred by container lines, e.g. customer size, customer type, and industry, are identifiable and simple to use. This finding is also compatible with the findings of Abratt (1993), who studied B2B segmentation applications in South Africa.

The theoretical segmentation framework in the qualitative research can be utilized by carriers who prefer adopting a-priori approach. Carriers may utilize a single base or a combination of multiple segmentation bases depending on their purpose. As shown in the segmentation template developed in this paper, customized marketing offering should be designed for customers considering customer segments regarding their strategic importance for carriers and specific needs and wants. Goals and capabilities of the carriers should always be born in mind while taking action for different segments.

The qualitative research also suggests adopting a port-specific market segmentation approach since each port's hinterland differs concerning characteristics of shippers and services offered by the carrier. The previous studies usually only investigate a single route. However, organization of a container line is located at the hinterland of a port and the customers in the port's hinterland ship their cargoes to multiple destinations rather than a single one. As a result, the port-specific market segmentation is proposed in this qualitative research.

The interviews in qualitative study frequently stressed the importance of relationships and effective communication as parallel to services and industrial marketing literature. This finding is coherent to study of Maloni *et al.* (2016), who indicate the rising importance of seller-buyer relationship in container shipping. The customized marketing offering, originated from market segmentation, can be helpful for developing sustainable relationships in container shipping. Thus, we can propose that market segmentation can be a useful tool for relationship marketing in service businesses which are similar to container shipping where hundreds of different customers with diverse characteristics and expectations exist in the market. Unlike the literature that defends market segmentation is outdated, our findings in this qualitative study suggest that market segmentation can be very helpful in one-to-one marketing and relationship marketing.

The quantitative segmentation research of this thesis adopts a post-hoc approach to explore the segments of container shipping market in Aegean Region. Based on several analyses, total six benefit segments are discovered. The smallest segment includes 31 shippers, and considering the fact that our sample represents less than 10 percent of the total exporters in Aegean Region, the segments found in this research are substantial, which is a pre-condition to make segmentation effective (Kotler and Armstrong, 2011).

The benefits that these six segments seek for are quite distinctive because the selection criteria factors are statistically different across the six segments ($P < 0.00$). It means that container lines can apply differentiated marketing offerings for each segment such as customized communication. With this characteristic, the segments in this post-hoc research provide another condition of effective market segmentation: Differentiable (Kotler and Armstrong, 2011).

It is very important that the segments are described by readily available demographic characteristics, which eventually allows segments to be measurable and accessible. These are also the criteria for effective segmentation (Kotler and Armstrong, 2011). The research shows that the six segments in the research have effective and statistically significant descriptors. The significant associations shown in Table 56 make sense in the practice as well. These associations are asked to 2 managers working at freight forwarding and 2 managers working in container lines. The interviewees found the associations very logical and coherent with their business practices, yet they found it hard to comment the association of number of employee and delivery terms. This suggests that the results of the research are also valid in practice.

For instance, NCS segment has significant positive association with minerals, basic materials, and low value cargoes which are always shipped by sea transportation. The sensitivity level of this segment is the lowest across all segments. All of these are in accordance with the realities of practice. The low value per container and in-sensitive cargoes usually looks for the lowest freight option and do not concern the time or other service elements in practice. This is why the association of “consumer” goods is negative while “basic materials” is positive. The positive association with “all seaway” usage, negative association with “North Europe”, and

positive association with “North America” destinations are also very logical and coherent. It suggests that the shipment destinations of this segment are usually far and do not have road or railway connections. The associations of the distant places are positive (Far East and Asia) while nearby locations are negative (Middle East, East Mediterranean).

There are many other statistically significant and practically valid associations in our segments. For instance, TS segment has high positive relation with the industries of “machine” and “refrigerated food”, while it has negative association with “minerals”. Machine and refrigerated foods are sensitive in nature and time is important for these shippers. Their value is certainly not low. The two time sensitive segments are both positively associated with “rarely seaway”, which, in parallel to practice, shows that these shippers may prefer faster modes such as road. Another interesting association is witnessed between monthly container volume and segment membership. VASB is the opposite of TCS and TS segments in terms of importance level attached to value added services and time. While “1-5 containers” is positively associated with TS and TCS segment, it is negative associated with VASB segment. In parallel, “100 and more containers” has negative association with TCS and TS segments, but it has a positive association with VASB segment.

Compared to the previous literature, the results of this study have some similarities and dissimilarities. Collison (1984) states that perishable and non-perishable cargoes have different scores on liner shipping service attributes. Our study also confirms that frozen or temperature controlled cargoes show some differences. They are significantly associated to the time seeker segment, indicating many of them are located in TS segment. McGinnis (1978) found that industry of shippers vary significantly across the segments. Lu et al. (2005) also suggest export cargo types are statistically different across the segments based on website service attributes of container shipping companies. Our findings are similar to McGinnis (1978) and Lu et al. (2005) in this issue.

Our findings are also parallel to Murphy and Daley (1994) who state that sea mode customers and other modes customer have different rankings of selection criteria in terms of reliability and service quality. In our results, “all seaway” customers are significantly associated with NCS segment while “rarely seaway”

customers are significantly associated with TS segment. These two segments are quite distinct than each other.

Mitchell and Wilson (1998) and Dibb and Simkin (2001) suggest that account size does not tell much about the needs and wants of customer in B2B markets. However, our findings in container shipping context indicate that account size (monthly container volume) can explain if a customer attaches importance to value-added services or not. Larger shippers usually attach more importance to VAS compared to smaller ones. In container shipping literature, Collison (1984) and Wen and Lin (2015) also indicate that size matters in customer expectations. This also shows that each B2B industry is unique and requires special segmentation analysis instead of adopting normative segmentation models.

To understand whether the a-priori segments of container lines in practice are differentiable or not Oneway-ANOVA test is conducted by using the segments of container lines derived from interviews and selection criteria factors explored in quantitative research. The tests illustrate that the a-priori segments of container lines are not as differentiable as the post-hoc segments discovered in the quantitative research. This is in parallel with the literature which suggest benefit segments adopting a post-hoc approach are superior to a-priori macro segments in terms of differentiability (Cheron and Kleinschmidt, 1985; Haley; 1968; Wedel and Kamakura, 2000). Among the a-priori bases, industry of shippers (which are custom-designed) is the most differentiable segmentation bases in terms of selection criteria.

CONTRIBUTION TO LITERATURE

This dissertation has several contributions and implications to the literature in both container shipping segmentation and B2B segmentation literatures. As far as our literature review that includes PhD dissertations and international academic journals, this is the first study that reveals practical segmentation applications of container lines at a region.

Hair et al. (2014) suggests that standardizing cases in cluster analysis can eliminate the respondent's bias, and more accurate segments can be achieved. In literature, some studies apply standardization of variables in cluster analysis when different scale points are utilized. Based on the literature review in this dissertation, cases are standardized for the first time in this study. Compared to non-standardize cluster solution, standardizing cases reveals better cluster solution that results in more balanced number of segment membership and more distinctive segments. Scholars interested in segmentation research are advised to use both case-based standardized and non-standardize cluster solutions and compare the results.

This dissertation uses selection criteria factor scores as the segmentation bases in cluster analysis. It is of critical importance and also a preliminary condition to use reliable and valid factors to have accurate segments. In B2B literature, several studies ensure reliability and validity of factors. However, literature in freight transport segmentation ignores this issue and has not applied CFA. This dissertation applies confirmatory factor analysis to ensure reliability and validity of factors concerning our literature review and suggests using CFA in other freight transport segmentation studies as well. It is important especially considering the variety of factor solutions in container shipping selection criteria.

Many academic papers show segmentation as a contradiction to relationship marketing, one-to-one marketing, and mass customization (Gronross, 1999; Sheth et al, 2000). However, this dissertation argues that segmentation does not necessarily contradict to these marketing strategies, but instead, it can play an important role as a first step for these strategies. For instance, by evaluating the firmographics of a customer, firms can ascertain possible segment membership of this customer, and thereby can have substantial understandings of the benefits sought by the customer.

Another novelty of this research is about the determination of industry categories. It is indicated in the literature that standardized industry code tells little about the benefits sought by industrial customers (Mitchell and Wilson, 1998). This thesis acknowledges this issue and proposes using customized industrial divisions considering the location and business of the segmenting company. This study determined the distribution of sub-categories of industry of shipper by considering the comments of interviewees and the shipment statistics. As a result, logical associations and statistical differences are witnessed across the sub-groups. This has also helped to make thorough implications for the container lines in the region. The four interviewees after the research is conducted found the industrial categories very similar to their business practices. This would also help to minimize the problem of gap between academic researches and practical applications. Thus, it is suggested for B2B segmentation scholars that customized industrial breakdown based on the regional and industrial characteristics are more effective than standard industrial classification.

This dissertation also contributes to the argument in the literature that supports the superiority of benefit-based segmentation, in other terms, micro segmentation (Cheron and Kleinschmidt, 1985; Haley, 1968; Wedel and Kamakura, 2000). Majority of the a-priori segments (macro) utilized by container lines in Izmir are not differentiable in terms of benefits sought by shippers. However, the post-hoc research in this dissertation (micro segmentation) reveals quite distinctive segments concerning the benefits of shippers.

This study contributes to both segmentation literature and container shipping line practice by proposing the application of port-specific segmentation programs instead of route-specific segmentation programs. Many factors affecting the benefits sought are related to the geography and culture of that region, thus each port region may need customized segmentation analysis. These patterns do not only change between countries, but also between the regions in a country. For instance, it is known in the practice that shippers around Mersin Port region attach more importance to the personal relations compared to those in Istanbul. Thus, port-specific segments seem to be more appropriate option for container lines. However, a further research is needed to prove this suggestion.

Regarding the bases used, this research is the first in freight transport segmentation to use value added services in a truly manner. Chao et al. (2013) also used a base named VAS in air freight segmentation, but that factor includes “freight rate”, “cargo safety”, and “flexibility in rate adjustments”, two of which are related to core service while the latest is about cost or pricing issues. Container shipping is facing a commoditization issue, and therefore additional services and relations are the key in the market now (Balci et al., 2018; Maloni et al., 2016).

In addition to VAS, relational factor is also utilized in our study as a segmentation base for the first time in transport and B2B literature. Using relation as a segmentation base is critical especially considering the recent findings on the importance of relation in container shipping (Balci et al., 2018). Utilization of these two factors is currently needed in the market and it is also an original contribution to the both literature and practice.

An interesting finding in the qualitative research is segmentation can actually be used for training the new personnel. Newly-hired and inexperienced marketing personnel can be trained about the distinct needs and wants of customers in different segments by considering their firmographics. As far as the author’s knowledge, this benefit of segmentation has not been mentioned in the literature before.

MANAGERIAL IMPLICATIONS

This dissertation has also some implications for container lines as well as other container shipping service providers whose customers are shippers. First of all, it should be reminded once again that the benefit segments discovered by adopting post-hoc approach reflect the differences between customers more effectively than the readily available segments created by adopting a-priori approach. For truly effective market segmentation, the lines are advised to explore benefit segments in the hinterlands they serve. If this is not possible, then the container lines can utilize the theoretical segmentation template that is proposed in our qualitative study. Although it is a-priori, it can enable for a more comprehensive understanding of customer differences.

The fact that benefit segments in quantitative study are differentiable enables lines to customize their services by considering their strengths and weaknesses as well as the customer needs and wants. For instance, in a marketing communication with Non-urgent Cost Seekers, it would be pointless if a container line mentions how transit time is short or how effective its value added services. For NCS segment, the focus should be given to price, and the elements of relationship development should be underlined. Almost each line has a cost advantage in at least one or a few routes. This segment can especially be targeted for the route(s) in which the line has a cost advantage.

Similarly, some container lines are more advantageous in some destination regions where the lines have home-country advantage. These advantages usually come from the services in the destination such as inland transportation and warehousing etc. For instance, CMA CGM is believed to have very effective services in France. Tarros Line has a good reputation with its door-to-door services in Italy. These are the elements of value added services. Thus, the lines that perform better in these services can target VASB and take an action to serve these customers. For these lines, this segment is quite actionable, which is another effective segmentation criterion (Kotler and Armstrong, 2011). Some of the lines have very accurate container tracking services, extensive global service coverage, and provide monthly performance reporting for the shippers. These can also be an effective way to attract VAS Buyers segment.

Similar to VAS Buyers, Pragmatic Service Buyers can also be targeted with the above value added services. However, to attract the customers in this segment, responsiveness of service should also be underlined. In fact, considering the pragmatic behavior of this segment arising from very low score on relational factor, the elements of responsiveness and VAS should be demonstrated in a numeric and objective way. For the potential new customers in this segment, performance reports as well as customer evaluations (some of the lines periodically measure their customer satisfaction on the services) can be presented in a numeric way.

Container lines should underline the time factor if they have a direct service or total transit time of their services is short for the segments of Time Seekers and Time-sensitive Cost Seekers. TCS segment is similar to NCS regarding importance attached to cost factor, but TCS is also concerned of the time. It is also not sensitive about the relational factor. As a matter of fact, TCS is mostly concerned of the core service. The lines should promote their routes which have relatively shorter transit time and lower freight rate compared to other lines.

TS segment, on the other hand, does not attach importance on cost as much as the TCS segment. This suggests that the shippers in this segment may ignore the cost factor as long as an important advantage is offered regarding the time by the line. In fact, this segment has the highest cargo sensitivity score across all segments. The importance given to time probably stems from this perception. Considering the relatively low importance on cost factor, these customers would be willing to pay higher price for shorter time. A deeper analysis can be applied on this segment to reveal the origin of why time is so important as well as other needs and wants. In this way, container lines can explore innovations that offer a solution to specific needs of these customers. As an example, CMA CGM invented a new container which is designed to carry lobsters alive instead of in frozen form. The container has many cage layers and it is filled by water, which keeps the lobsters alive until its final destination. The real need of shipper is actually having the lobster fresh, and that is why these shippers probably pay more attention to time factor. Such innovative solutions can enable container lines to enjoy premium charges, which would have vital importance in the current market situation.

Relationship Seeker segment, the smallest one, attaches the lowest importance on cost and time factors across all segments, but has the highest one in

relational factor. Rather than cost and time, the container lines should emphasize the elements of relational factor. The personnel of the line should focus on building strong relation with these customers. Taking the low importance on cost issue, these customers are also unlikely to switch to another line when they receive a lower freight offer. To accomplish this, a long term relationship should be ensured. Shippers are business customers and buying process of B2B customers are different than consumers (Webster and Wind, 1972; Webster, 1984). To enhance a relationship with shippers, a perception should be created in the eye of shippers that they actually receive some important benefits with the container line they work with. Therefore, container lines should perform well on responsiveness and VAS (this segment scores higher than average) to enhance their relation with the shippers in this segment.

It may be suggested that the container lines can launch new brands to better attract the segments that they plan to target. The new brands can be created based on the target segments. Dow Corning, a silicone company, applied needs-based segmentation (post-hoc) and created a new brand called “Xiameter” for its price seeker segment. This new brand was very effective to keep the price sensitive segment (Thomas, 2012). Similarly, in shipping industry, Maersk group has successfully launched new brands based on the routes they serve (Seago Line for Europe, Safmarine for Africa, and Maersk for global destinations).

The segmentation is a quite complex process for B2B companies, and requires a dedication and involvement of not only marketing personnel but also personnel of other departments within the company. The inclusion of the personnel should be at the very beginning rather than after the completion of segmentation analysis. Only by this way segmentation can be adopted by all personnel of the companies, which eventually contributes to deliver superior customer service in a holistic approach.

Segmenting customers can allow container lines to have deeper insights of customer needs and wants. This would enable container lines carry out innovations. Keeping the Marketing Myopia article of Levit (1956) in mind, understanding “real needs and wants” of customers is the key to survive. Container lines cannot rely on the growth of container shipping business. McLean grasped the real needs and wants

of shippers and invented the containers in 1956. Our segmentation analysis can be a first step for container lines to understand real needs and wants of customers, and hopefully find out innovations that customers value for. Considering the commoditized structure of container shipping market, such innovations are necessary.

The container lines are suggested to reveal the benefit segments of their customer portfolio rather than segmenting the customers in a-priori way through macro bases. However, revealing benefit segments requires experienced marketing personnel who are proficient in conducting such analyses. In cases where container lines are not able to (or do not prefer) discover benefit segments, they can adopt the flexible segmentation framework created in the qualitative research for their a-priori segmentation.

CONCLUSION

Container shipping is one of the most indispensable elements of international trade and global supply chains. Container shipping is a vital industry not only for the container lines themselves but also for exporters, importers, custom agents, freight forwarders, trucking companies, ports, and eventually, for individuals. It is the industry that has facilitated the globalization and enabled global supply chains. However, container shipping business has been facing serious challenges in the recent years. The market has been experiencing overcapacity and low profitability problems. Moreover, the services of container lines are getting “commodity-like” especially following the trend of strategic partnerships in the industry.

In such a market condition, customer needs and wants should be well understood. Considering the large number of customers in container shipping, market segmentation is needed in the current market structure. However, only a few academic papers have so far investigated market segmentation in container shipping, and those which investigate do not discuss the segmentation thoroughly in container shipping services. Thus, the purpose of this thesis was to investigate market segmentation in container shipping and discuss the segmentation approaches within the scope of container shipping.

First, a qualitative research implementing semi-structured interviews is conducted with container lines in Izmir to reveal if they implement market segmentation or not; what bases they use for segmenting the market; and what purposes they have for market segmentation. The results indicate that 11 of 20 container lines do not implement segmentation in Izmir. The results also illustrate that the container lines in Izmir adopt a-priori approach and use readily available bases such as customer size and destination region. None of the lines segment the markets based on the needs and wants of shippers. Based on the opinions of container lines in the interviews, a theoretical segmentation framework is proposed to be used in a-priori approach.

In addition to the qualitative research, a quantitative segmentation analysis adopting post-hoc approach is applied on container shippers in Aegean Region of Turkey. Based on the container line selection criteria factors, the segmentation

analysis – including EFA, CFA, and cluster analysis – ascertains total six segments in Aegean Region. The segments are distinctive in terms of the selection criteria of shippers. The segments meet the criteria of effective market segmentation: Substantial, differentiable, actionable, measurable, and accessible. The segments also provide evidence for the criterion validity, without which the segments would not be meaningful and practically correct. Substantial number of statistically significant associations between the segments and descriptors are achieved, which is necessary to identify the benefit segments. A detailed discussion of the results of this research is presented at the end of related section.

Upon the qualitative and quantitative analysis, the segmentation bases of container lines explored in the qualitative research are tested to understand if selection criteria between the segments differ. In this way, we can see if the segmentation bases of container lines in practice in Izmir create segments that are differentiable. The results indicate that the a-priori segments are not as differentiable as the post-hoc segments in our quantitative research in terms of the selection criteria, or in other terms, benefits sought by container shippers. This dissertation claims that benefit segmentation using a post-hoc approach is more effective than a-priori approach used by companies in container shipping market. This is parallel to segmentation literature which state that benefit-based segmentation is superior to readily available segments for grasping the needs and wants of customer.

Market segmentation is one of the most fundamental yet challenging concepts of marketing. The segmentation analysis consists of several important steps and each step requires being very cautious. This dissertation offers comprehensive yet not complete information regarding market segmentation in container shipping. Many more details exist to be explored in this topic as well as other important concepts of marketing within the container shipping context. Market segmentation is an ongoing process rather than a one-time research especially in dynamic B2B markets such as container shipping.

LIMITATIONS AND FURTHER RESEARCH

Like many other researches, this study is also subject to several limitations. The first limitation of this paper is that it focuses on only the segmentation of container shipping market in Aegean Region. Although some implications can be made for whole container shipping market, the results derived from our sample can be generalized only for Aegean Region. The segments found in this paper might not exist in other parts of the World, or even Turkey. A future study can be done in another location to compare the results.

The selection criteria includes relationship factor, which is an important issue in this region. However, it may not be as important as here in, let us say, North Europe or North America. Different variables may be needed for the segmentation analysis based on the needs and characteristics of the specific location. Therefore, authors in the other regions are advised to conduct preliminary interviews with practitioners to ensure content validity of variables specific to that geography.

It is also noticed in the analyses that some of the descriptors in the quantitative part of dissertation could have been more finely tuned. For instance, the range of cargo value categories could have been narrower so that cargo value could result in more effective implications. However, in that case respondents would be unwilling to reply the question because of confidentiality. A future study could make the range at least slightly narrower than our categories. It is also not asked if a shipper is the producer of the cargoes or only traders. This should be asked in a possible future study.

Although customers of container lines consist of both shippers (exporters and importers) and forwarders, this dissertation only segments the shippers. Among shippers, only exporters are investigated in this study. The reasons why forwarders and importers are not included in the study are several. First, most of the marketing facilities in the region are directed to exporters rather than importers. Besides, there is no importer association or similar organizations that we can receive a list of importers to determine the population and sample. Container line selection criteria of forwarders and shippers are usually different, so it is not very logical to segment simultaneously in the same analysis by using same variables. Besides, our findings

not only provide implications for container lines, but also freight forwarders who are also container shipping service suppliers of exporters. A future study may also segment freight forwarders and importers.

This dissertation segments the market in general terms. The results would have been much more specific if it was conducted with the customers of a single container line by considering the segmentation purpose of the company as well as the resources. Such research can be conducted by a future study. Buying centre of a company usually consists of more than a single company but this thesis has only collected one response from each company. Future studies may involve different people from a single company and discover the differences in terms of needs.



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APPENDICES

Appendix 1: Interview questions of qualitative research

Interview Questions

1. Are you the third party agent of the container line or the branch in the region?
2. How many containers do you handle at the ports in Izmir?
3. What is your position in the company? How long have you been in this position and in container shipping industry?
4. What are the major industries of your customers in the region?
5. Could you please tell us about the characteristics of your customers? Do they have different expectations? If yes, please explain based on what their expectations change?
6. Do your customers show significant variety in terms of their cargo volume, destinations, cargo value, and other company or product characteristics?
7. Could you please tell us about your marketing organization and planning?
8. How do you manage your customer relations?
9. Do you segment your customers?
10. If you segment the market, what bases do you use for segmenting the market? Is it the industry? Size of company? Destination?
11. If you don't segment, what is the reason for not segmenting? If you segmented the market, which bases would you use for segmenting the market?
12. What is the reason of choosing these bases?
13. What are / would be the purposes of segmenting the market?
14. Would you like to add anything else?

Appendix 2: Questionnaire for quantitative research

Questionnaire of the quantitative analysis

This survey study has been prepared for the Ph.D. thesis of Gökçay Balcı under supervision of Assoc. Dr. İsmail Bilge Çetin who both work at Maritime Faculty at Dokuz Eylül University. The purpose of this survey is to perform market segmentation analysis of container shippers. The respondents' company and/or personal details will not be undisclosed and the information you provide will only be used for academic purposes. The average response time of the survey is around 5 minutes.

Should you have any question, please do not hesitate to contact

Best Regards

Gökçay Balcı

Email: gokcay.balci@deu.edu.tr

1. Please choose one of the below categories that includes your most exported product through seaway transportation.

- ☐ Minerals & stones (Block marble, feldspar, quartz, boron, salt, chrome, various unprocessed stones etc.)
- ☐ Tiles & ceramics (Various tiles and processed marbles or granite)
- ☐ Machinery (Industrial machinery, agricultural machinery, heaters, boilers, etc.)
- ☐ Refrigerated foods (Dairy products, fresh vegetables and fruits, poultry products, seafood etc.)
- ☐ Food (All dried foods, spices and herbs, olive oil, dried fruits, tomato paste, beverages.)
- ☐ Spare parts (Automotive spare parts, spare parts of machinery and other industries, bearings etc.)
- ☐ Apparel products (Garment and underwear, shoes, bags, etc.)
- ☐ Textile products (Cloth, yarn, fibers etc.)
- ☐ Chemicals (Polymer products, cleaning products, chemical raw materials.)
- ☐ Others (Please write down)

2. Please describe your most exported product through seaway transportation (Mention its commercial name, packaged or not, etc.)

3. Please select the most frequent export destination of your product.

- ☐ North Europe (Felixstowe, Hamburg, Rotterdam, Antwerp, Le Havre, and etc.)
- ☐ East and South Europe (Trieste, La Spezia, Barcelona, Rijeka, Geneva..)
- ☐ Far East, Asia, and Australia
- ☐ North America
- ☐ East Mediterranean
- ☐ Middle East
- ☐ North Africa
- ☐ Central and South America
- ☐ West, East, and South Africa

4. How frequently do you use seaway for exporting your product?

- ☐ All seaway
- ☐ Usually seaway
- ☐ Rarely seaway

5. Which container type do you use for exporting your product?

- ☐ Dry
- ☐ Reefer
- ☐ Flat rack
- ☐ Open top
- ☐ Other (please indicate.....)

6. We ship our products mostly in

- ☐ 20 feet container
- ☐ 40 or 45 feet containers

7. Please indicate the sensitivity level of your product against below conditions.

	1= Not sensitive	2	3	4	5= Very sensitive
Sensitiveness to dirtiness					
Sensitiveness to moisture					
Sensitiveness to scent					

8. Please indicate your average monthly container volume.

- ☐ 1-5
- ☐ 6-14
- ☐ 15-39

- ☐ 40-99
- ☐ 100 and more

9. Please indicate the number of personnel at your company.

- ☐ 1-9
- ☐ 10-49
- ☐ 50-249
- ☐ 250 and more

10. Please select the statement that defines you best

- ☐ We only work directly with container lines or their agencies
- ☐ We only work with freight forwarders
- ☐ We work with both freight forwarders and container lines

11. How much importance do you attach to below criteria when selecting a container line service?

1	2	3	4	5	6	7
Very low importance	Low importance	Below average importance	Average importance	Above average importance	High importance	Very high importance

	1	2	3	4	5	6	7
1. Short transit time							
2. Directness of sailing							
3. Damage-free transportation							
4. Low freight rates							
5. Flexibility in payment							
6. Willing to negotiate freight rate							
7. Low local port fees of carrier							
8. Fast documentation							
9. Error-free documentation							
10. Quick response to inquiries							
11. Effectiveness of online tracking							
12. Availability of empty containers							
13. Sailing on promised time							
14. Accessibility of line personnel							
15. Wide global network of carrier							
16. Ability of carrier to offer effective door-to-door shipment							
17. Availability of warehouse service							
18. Availability of compatible EDI							
19. Customized performance reporting							

20. Frequency of visiting by carrier personnel							
21. Strong personal relation with carrier personnel							
22. Consultancy given by carrier when necessary							
23. Long demurrage free-time period							
24. Cleanliness of containers							
25. Reputation of the carrier in market							

12. Please indicate your mostly preferred delivery term

- ☐ FOB & FAS
☐ CFR & CIF
☐ DAP & DDP

13. Please select your agreement in the below statements.

	1 Totally disagree	2	3	4	5 Totally Agree
Competition in our industry is cut-throat					
The number of competitors is high in our industry					
Competitors in this market pursue aggressive policy by price reductions					

14. What is the approximate value of your product per a 20feet container?

- ☐ 0-14.999USD
☐ 15.000 – 44.999USD
☐ 45.000 – 79.999USD
☐ 80.000USD and more

15. What is position at the company?

16. How many years of experience do you have in the industry?

17. Your e-mail address

18. Your opinions about the survey?
