

“A comparative analysis of factors that determine the competitiveness of short sea container traffic amongst Scandinavian and European ports.”

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MASTER THESIS

May 2016

ACKNOWLEDGEMENT

First and foremost I wish to thank my supervisor for his invaluable assistance throughout the entire period of writing this research paper. Thank you for your patience, understanding and above all for your guidance.

To all the lecturers throughout my course at the university.

I would like in a special way to thank the shipping companies' officials, port administrators, and forwarders who assisted me with crucial information by filling the questionnaires and making my study a success.

Dedication

This work is dedicated to my family for their understanding and time devoted to the paper.

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Abstract

This thesis assesses the specialized competitiveness of Norwegian container ports with respect to a collection of similar performing ports in other Scandinavia. The rationale for the study was primarily based on the premise that there is dire need for the seaports to improve their performance because of the constant pressure of increasing container backlog. The method of reasoning is that a specialized proficiency appraisal of Drammen and Oslo was not found in the literature; in this way, it obscure's what their potential for development is against other equivalent global ports. A descriptive and qualitative research approach is used for the research. The information set involves Drammen and Oslo ports which were used as a subset among other ports located in Norway. Information was obtained by personal interviews with some stakeholders and a reading of relevant literature on the subject. Other than the productivity investigation, an intent was made to gather a lot of information from the administrations of the separate ports. The study focusses on the following: Firstly, the efficiency of port operations would be exhaustively discussed using the parameters outlined above. Secondly, Norwegian ports level of utilization and appropriate pricing will be examined. Thirdly, for Norwegian ports to enhance their general effectiveness and competitiveness, there has to be a focus on developing and building their size as Drammen and Oslo ports have done in respect to functions performed.

Chapter 1.

1.1 Background.

Global trade patterns and the growing flow of manufactured goods has contributed mainly to the extensive use of seaports due to the globalized trade (Schøyen et al, 2013). This means that efficient handling of goods in the ports is of dire significance. Therefore, port competitiveness plays a vital role in the distribution channel as has been seen in the recent years. A seaport's efficiency plays a critical role in ensuring well-functioning distribution channel. This is because seaports act as a crucial link in the entire trading and distribution channel thus, seaports are significant contributors in the country's international competitiveness and the supply chain. This contribution of ports towards the international competitiveness has increased tremendously over the past decade in all the nations. For the Norwegian seaports, the container flows increased tremendously by 23% in the years 2002-2008 there was also a decline due to the financial crisis that set in 2008. Container traffic rose again in the coming years. This also became a replica in the transportation and logistics services of containerized freight. It is, therefore, necessary to understand the factors that determine the seaport effectiveness which is critical for the seaport's competitiveness and also, to address the issue of lessening payload streams. In the containerized payload market in 2008, about 25% of the world's main 40 compartment tackling ports saw a decrease in load turnover. If we take a collective look at ports in Europe, two out of the main three ports saw a diminishing return in turnover in 2008 (Voorde et al, 2008). In looking at the data set I went into ssb.no to find current data for the ports, the data showed a cyclical movement for the ports with a marked improvement of 13% between 2013 and 2014. Responding to these progressive down turn with a sufficient reaction is a test for the port authorities. Accordingly, in this research study I will attempt to address the concern of competitive intensity, the criteria that decides it and assess the qualities and shortcomings of the ports in dealing with the phenomenon. Competitive intensity can be further clarified by the nature and fierceness of the competition between ports to keep and maintain their customers. I looked at it further by providing the strategy the ports use for that purpose. In the investigation, the emphasis will be based on chosen seaports of Western and Northern Europe but particularly Drammen and Oslo. For the most part, the instance of port stake holders will be dissected, as this analysis includes the most grounded overall changes that can influence port competitiveness.

1.2 The problem statement and research question.

The main reason for embarking on the research was to have an insight into the workings of various ports around Norway, the Scandinavia and Europe. In going into the research, I tried to answer a set of questions that relate to and identify with level of port competitiveness in Norway and other Scandinavian countries. In opting for port studies, cognizance was taken into consideration regarding the importance of the Maritime industry in the multi-modal transport system of Europe.

The research problem to help me define and put the research in proper perspective can be classified into.

Research questions

The primary objective of this research is to study port competitiveness. More specifically, I will measure the competitiveness of the Norwegian ports and analyze how to improve its performance. To achieve this goal, I needed to identify the most crucial traffic category for the Norwegian port. By narrowing down the research scope, I can focus on the most vital part of Norwegian seaports port and identify eventual competitiveness.

Research question 1

How are traffic and container throughput factors that impacts on the competitiveness of the most important Norwegian ports?

To answer this question, literature on traffic and container throughput linked to port performance, was reviewed. The literature on productivity of specific Norwegian ports and terminals will be reviewed, and a comparison will be made between its recent and historical performance, thereby exploring whether Norwegian port terminals improves its performance over a given period.

Research question 2

Have Norwegian ports improved their competitiveness in the present years?

A detailed descriptive analysis of data collected from the ports will be carried out to answer the questions that are proposed to determine why one port has a better or more traffic and success than the other port.

Chapter 2.

Literature review

2. Brief Introduction:

Choosing the topic to write was easy because of my interest in logistics and supply chain.

The main topic though was a request to investigate the factors that are responsible for how companies compete within the short sea market segment and ports related to the activity. The request was suggested by the department and the topic was instantly accepted by me. I have worked to improve the topic along with my Supervisor. In addressing the topic I decided on a two prong strategy.

1. Read and research related topics within the segment and draw a guiding conclusion as presented by previous research.
2. Seek and interview relevant operators and agencies within the segment to give me a deeper understanding of issues and eventually validate my findings from the literature review and interviews conducted.

In all I believe I have been enriched by the exercise and this is my modest contribution to the discussion below happy reading.

2.1 Definition of key terms used in the study

Port competitiveness; refer to the port's throughput. This can adequately be defined as the ability of port operators to offer port services that meet international quality standards at competitive prices and at the same time provide adequate returns.

Quality: refer to the standard of service provided by the ports. This can in some cases refer to the extent the ports are willing to go to provide the extra service that would put them up above competition.

Efficiency; this is the standard service provision with minimum use of resources.

Price: refer to the charges incurred by shipping agencies and other port users

2.1.2 Ports and Competition

A variety of entities owns seaports; it could be owned by the state, regional, local government or private entities (Notteboom, T.E, 2010). Therefore, ports are subject to various degrees of supervision and regulations. Initially, ports were seen as providing service to the public's economic interest and hence were paid through taxation, however, in the recent decades, ports have been seen as commercial entities providing services to achieve profitability. However, according to Bennathan and Walters, sea ports have other several objectives, and therefore, the underlying principle was classified into two doctrines which were referred to as the continental (European), and the Anglo-Saxon doctrines. The European doctrines, according to Bennathan and Walters depicts the ports as the social infrastructure and; therefore, the ports derive their value to the contribution to the development of the nation, region and thus are not profit oriented. On the other hand, the Anglo-Saxon doctrines depict the ports to be self-sufficient and, therefore, should be profitable.

There is a fundamental need to understand the various dimensions of seaport and ports services and not only the context in which ports are seen to be part of. However, according to Gordon & McCann, 2000, the criteria used to analyse and define the ports vary diversely. Initially, Ports were analysed according to the geographical aspect, however, currently; they are analyzed and defined according to the economies they are part of. However, the geographical context is still a fundamental aspect to consider when analysing the ports and ports services. Therefore, both geographical and economic dimensions of the ports and ports' services tend to be explicitly utilized while analyzing the ports and ports services. On the other hand, some researchers like Airriess, 2001, and Song, 2003, started out in analyzing the ports basing on the geographical context regarding land-sea interface while focusing on the port's primary and secondary users. With this literature, it is also important to indicate that the public administrations that the ports are part of are fundamental aspects to consider regarding the land-sea interfaces.

According to Estache et al. 2004, seminal paper, an investigation of the productivity differences between eleven ports in Mexico over a given period was carried out. The scholars applied the DEA based MPI model based on the CRS (Constant Return to Scale) and VRS (Variable Return to Scale) technology. The measures for the output was taken to be the tonnage that was handled while the inputs were berth lengths and the number of the workers at port. Estache et, al. 2004 concluded that the MPI increased in the period of study for the

majority of the ports. This increase or gains for that matter were attributed to specifically two factors; these are; the adoption of new technology and the technical efficiency improvements.

In 2009, Guerrero and Rivera followed up on the study carried out by Estache et al. 2004 by analyzing the productivity growth for the seven container ports in Mexico during 2000 to 2007 by using the DEA based MPI model. In this study, the output was the number of (TEU) twenty feet equivalent container units that were handled during that particular period. The inputs were berth lengths, the areas of the terminals and the number of the equipment handling the containers. The results of the study indicated that there was an increase in the MPI in the five out of seven container ports in Mexico studied. This increase was as a result of three specific factors. These are; new technologies that were adopted during the period of study, the technical efficiencies improvements with regards to the operations and lastly the enhancement of the scale efficiencies of the ports studied. Moreover, the study further concluded that there was a productivity increase which was much greater for the medium size container terminals as compared to those of the hub terminal.

The international trade and maritime transportation are dependent on one another; this is because maritime transport enables the development of closer links between countries and even continents. There is also a critical logistic process for the operation and utilization of maritime transportation. According to Takel, 1978 ports are the primary facilitators in linking the economic system with the international economies and hence they act as the hub of the trading centres. With the current economic growth of the foreland and the hinterlands, there is an increased demand in which the capacity of the ports influences the economic development of the regions.

According to the EU Directorate for the financial enterprise affairs and the competition committee on port and ports services, some factors affects the competition in ports and ports services. These are;

2.2 Competition constraints at seaports.

According to the committee, there are two main competition constraints, these limitations specifically originates from other modes of transport, i.e. intermodal competition, and inter-port competition. In analysing the strength of these two constraints, the committee considered the substitutability between the two modes of transport. Two main questions came to be, -Can road transport be substituted for maritime transport? Or can port A be substituted for port B? According to the OECD, Organization for Economic Co-operation and Development, whose Secretariat is based in Paris, there appears to be a general agreement between the member countries that other modes of transport only contribute very little on the constraints and challenges of maritime transport.

2.3 EU Laws and port competition.

According to the EU laws on the competition at seaports, a seaport can be deemed to have market power only if it acts independently of its customers and other competitors. There are factors that determine if the seaport has market power, these include, the nature of the current competition among seaports, threats of potential competition, and the extent of the purchasing power of the customers. Another fundamental aspect is the growth of the market share for the seaports. Therefore, seaports are deemed to have market power if it has a larger and continuous market share. The existing level of competition between the ports is not only a relevant factor to consider but also the potential or prospective competing ports.

In the circumstance of the competition between seaports, it is important to distinguish the factors that determine the intensity of seaports. This examination is split up into two unique categories. First, there is a need for one to determine who makes the decision. Secondly, a clear proof of their criteria used in decision making. Keeping in mind the objective to do that, numerous references was utilized as the basis for the systematic review (Bird & Bland, 1988). The decision of sources was not compelled by topographical contemplations. The attention was on the criteria that the decision makers recognize as critical to the procedure that they utilize.

The dynamic attributes of the competition in the port industry are most plainly observed in Europe as depicted by Cullinane and Khanna (2000). The competition that exists among the seaports is as a result of the state of power of individual seaports and has over the years resulted in various analysis of the dynamic seaport environment, (Cullinane & Wang 2006). Moreover, the competition has led to the proficiency and efficiency of the ports. The expectations of these evaluations have been to determine the reasons for methods for

enhancing and or improving the ports and ports services (Wang & Cullinane, 2006), the power among the individual ports have given rise to the dynamic and aggressive competition in the seaport environment (Gonza 'lez & Trujillo, 2009). A proficiency appraisal of the Norwegian compartment ports provides limited literature of transportation, transport financial matters, effectiveness and profitability examination, and sea financial matters. This is tragic because Norway has additionally been affected by the worldwide advancements in the seaports business; consequently.

According to (Schøyen, 2013) in *Containerization International Yearbook*, the administrators and the decision makers should have a universal premise when it comes to decision making on the ever dynamic and aggressive port. On the other hand, the focus is directed extensively on the contention that the effectiveness appraisal of Norwegian holder ports is required because of the improvements in the seaport business in Europe, especially in the recent decades. First, the compartment ports are an imperative and indispensable piece of Norwegian transport and supply chains and the entire Norwegian base. Around 70 for each penny of imported products and 60 for every penny of traded merchandise, as measured by weight, enter the nation through compartment ports. Secondly, every year, around 600 000 TEU (20 feet proportional holder units) are transported through Norwegian compartment terminals, and around 2/3 of this volume enters through the holder ports in the Oslo fjord locale. Thirdly, in the period 2002–2007, the holder courses through Norwegian ports expanded by 23 for each penny (Statistics Norway, 2011), and in particular. According to the ssb.no in its more recent survey release March 2016, the gross tonnage of goods that passed through the Oslo and Drammen ports in the 1st quarter 2015 were as follows 2,101,853 million tonnes or 2,8% for Oslo and 1,224,153 or 1,59% for Drammen ports.

Lastly, in the Norwegian National Transport Plan for the years 2010–2019, the administration pronounced that oceanic transport ought to be incorporated into the vehicle arrangement as a method for enhancing the execution of the vehicle division. The point of this article is to survey the productivity of Norwegian holder ports contrasted with significant Nordic and UK ports. The fundamental experimental commitment is that it is the first and most important to consider the productivity of Norwegian seaport industry. In assessing information of this nature a standout amongst the most-referred-to information hotspot for holder port information, will undoubtedly be *Containerization International Yearbook (CIY)*.

2.4 Port Authorities

The main authorities recognized by previous studies are shippers, forwarders, terminal administrators, and transportation organizations. A few researchers demonstrate likewise port powers and government organizations as affecting the port decision of those on-screen characters. At the point when settling on the port decision, shippers, delivery organizations, and forwarders figure out which port will be utilized for the development of merchandise in the short and medium term. For terminal administrators, the port decision choice is a long haul choice to put resources into superstructure (e.g. workplaces, distribution centres, workshops) and terminal gear (e.g., cranes, transport lines). A noteworthy part – 15 of the studies – distinguishes shippers as the primary or one of the chiefs in the port determination. Studies done by Branch (1986), Kumar and Vijay (2002), Murphy and Daley (1994), Nir et al. (2003), Tiwari et al. (2003), and other researchers concentrated just on shippers as leaders in port determination.

Different sources, similar to Slack (1985), Murphy et al. (1992), Song and Yeo (2004), De Langen (2007), and Cullinane et al. (2005), consider shippers, as additional leaders for port competition determination. The studies that assess forwarders' choice in the port decision include Slack (1985), Murphy et al. (1992), and De Langen (2007). In these sources, different on-screen characters are additionally considered. Be that as it may, in the investigations by scholars like Bird and Bland (1988), Tongzon and Sawant (2007), forwarders are the main chiefs considered, and a study was identified as the system for exploration. Terminal administrators are sited in just three sources (Song and Yeo (2004), Acosta et al. (2007), Meersman et al. (2008)). Just a couple (Frankel (1992), Cullinane et al. (2005), De Martino and Morvillo (2008), Meersman et al. (2008)) concentrated on port decision criteria impact by government/port power choice.

2.5 DEA (Data Envelopment Analysis)

Shippers and delivery organizations have been in the centre of all the analysis during the entire period secured by the writing checked on (from the mid-80s till 2009). For a brief timeframe around 1990 (Bird and Bland (1988); Frankel (1992); Murphy et al. (1992) and other scholars likewise concentrated their studies on the forwarders. Terminal administrators were assessed as port decision chiefs in the later years.

Various Researchers who have managed the productivity estimations of ports have given a literature audit on the utilization of DEA to survey the execution of seaports. Nonetheless, the most intensive review and basic investigation of the significant studies that have utilized the DEA are found in Panayides et al. (2009). Panayides et al. (2009), highlighted some issues and impediments in the use of the DEA system in the seaport setting, especially regarding the particular parameters, and the testing space and the kind of DEA to be connected. A key finding of their exploration was that there is a requirement for specialists to settle on the quantity of inputs and yields to be utilized as a part of the model in connection with test size. Besides, in spite of the fact that a more noteworthy number of inputs and yields are alluring, keeping in mind the primary objective to catch the many-sided quality of port generation. This, therefore, means that there must be satisfactory specimen size, or the outcomes will be one-sided. Maybe the ideal method for supplementing the exhaustive audit by Panayides et al. (2009) and Woo et al. (2012) is to incorporate more concentrates, for example, the arguments that have utilized the Stochastic Frontier Analysis (SFA), and afterward, mention some broad objective facts. Distributions on seaport productivity estimations were situated through ventures in a few databases.

2.6 AHP Model (Analysis Hierarchical Process)

In looking at the concepts that help measure competitiveness in port operations, AHP is one of the various models that has been extensively used by researchers as a decision making tool. The key searches for AHP for my paper were Kannan, 2010; Kannan et al., 2011; Lirn et al., 2003; Lirn et al., 2004; Song, 2004; evaluation criteria for port selection behaviour of shippers' (Ugboma et al., 2006); Wong et al., 2008; Yuen et al., 2012

2.7 Current Trends in Maritime Transportation Shipping Companies and Terminal Operators

Maritime transportation is a profoundly globalized industry, both in operation and proprietorship. Around 67% of the worldwide armada (in tonnage) is under a banner of accommodation, which gives less regulation, lower registry expenses, and lower working expenses. In a transportation industry officially overwhelmed by extensive vessels, mergers, acquisitions and vital partnerships, the potential cost of investment funds adrift are getting smaller and the weight to discover cost reserve funds in the field of hinterland logistics is developing.

Other than expense and income contemplations, interest is the principle main impetus for the bearers to coordinate their administrations along the supply chains. The players that have originally been concerned just with the transportation of products from one point then to the next are currently looking for logistics organizations in their territory of operation, stock practices, store network coordination, and logistics data framework administration are currently the major concern of the shippers and freighters. Delivery lines are progressively assessing their armada setup in capacity with the intent to meet the logistics necessities of their client base these necessities include; the value of port service, travel time, plan, unwavering quality, liner administration recurrence and vicinity to showcases). Worldwide port administrators have assumed a generous part in the flow of port holder terminals as they accommodate the operation of terminal offices and also for the vital arranging of founding speculation. Both transient and long haul time skylines are a piece of their worry as fleeting issues are connected with the limit and nature of their administrations while long haul issues concern market extension. They come in three noteworthy classes; stevedores, sea transportation organizations and money related property.

2.7.1 Stevedores: Port terminal administrators that ventured into new markets to repeat their aptitude and to enhance their income. Port of Singapore Authority (PSA) is the biggest worldwide terminal administrator originating from a stevedore foundation.

2.7.2 Oceanic transportation organizations: Put resources into port terminal offices to bolster their centre sea shipping business. AP Moller (APM), a guardian organization of Maersk, is the biggest worldwide terminal administrators originating from a sea transportation foundation.

2.7.3 Money related property: Different money related premiums running from speculation banks, retirement stores to sovereign riches assets pulled in by the port terminal segment as a benefits class and for the income potential. The greater part has an aberrant administration methodology, obtaining an advantage stake and leaving the current administrator to deal with the operations. Others will oversee the terminal resources straightforwardly through a guardian organization. Dubai Ports World (DPW), a sovereign riches asset possessed by the Dubai government, is the biggest worldwide terminal administrator originating from a money related holding foundation.

In the previous decades, the compartment port terminal industry saw even and vertical joining procedures. This includes mergers and acquisitions of existing terminals or the development of new terminal offices (natural development). The ordinary performing artists that considered port operations as their centre business, stevedores' organizations, have ventured into new areas. This procedure was corresponding with vertical joining systems sought after by a few oceanic delivery organizations that have put resources into terminal operations straightforwardly or through guardian organizations. The money related part takes after a more half and half approach as vertical or level reconciliation methodologies relies on upon the benefits class of the holding.

Figure 1 - Top 12 Global Port Operators in Equity-Based Throughput, 2007

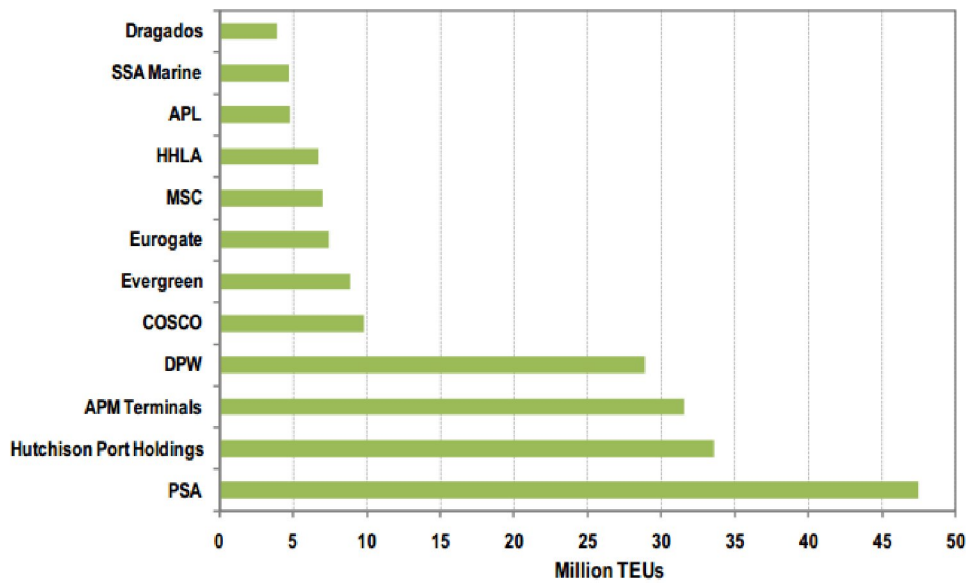


Figure 1

Source: Drewry (2008), The Annual Review of Global Container Terminal Operators – 2008.

According to Drewry (2008), the terminal administrators have different stakes relying upon the concerned terminal; therefore, equity base is throughout used to quantify the individual measure of containerized activity they handle (Fig 1). Case in point, two terminal administrators may have individual stakes in a terminal of 75% and 25%. On the off chance that that terminal handles 100,000 TEU every year, then 75,000 TEU will be ascribed to one terminal administrator and 25,000 TEU to the next. By utilizing such a measure, PSA is the world's biggest terminal administrator, regardless of the fact that HPH, DPW and APM have more terminals in their portfolio. Really, PSA claims a 20% stake in HPH, which from a value based throughput point of view passes on movement took care of by another terminal administrator.

Figure 2 - Container Terminal Surface of the World's Major Port Holdings and Shipping Density, 2009

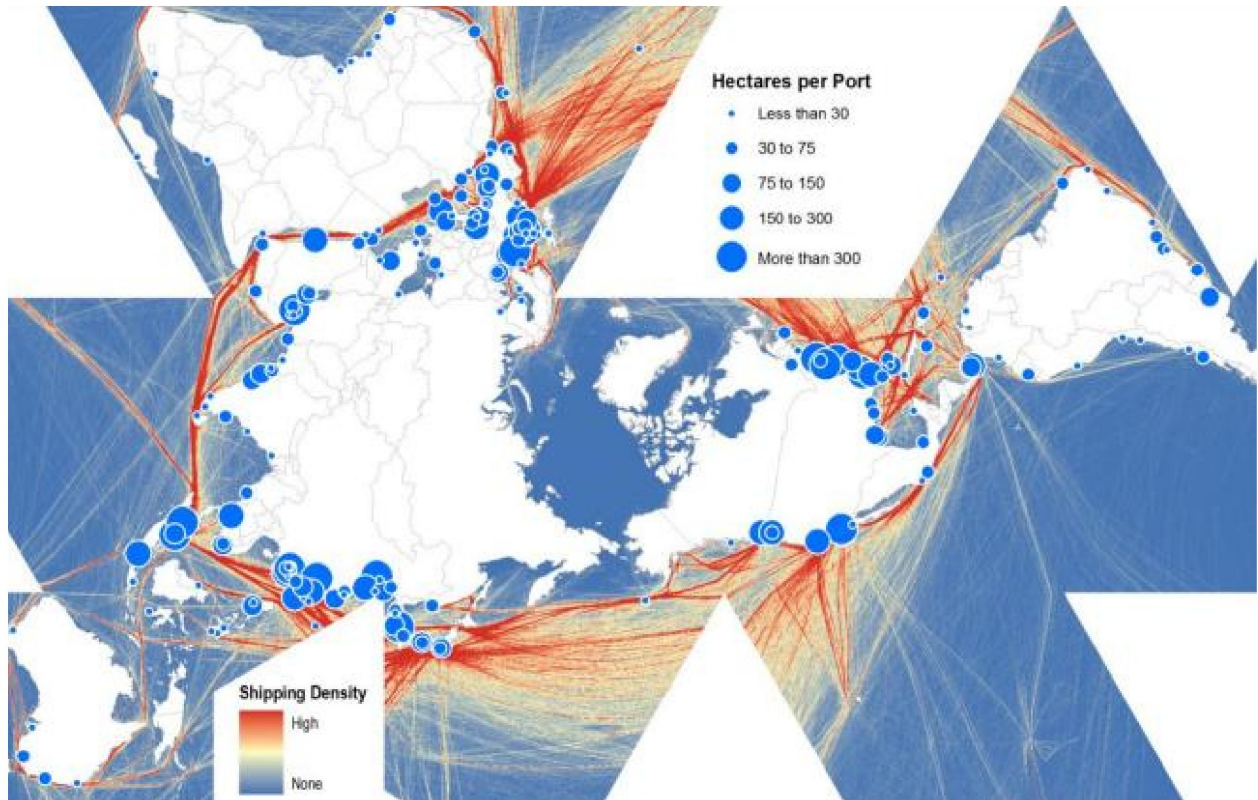


Figure 2

Source: Drewry (2008), Annual Review of Global Container Terminal Operators – 2008.

A stock of more than 400 compartment terminals all through the world's principle ports uncover generous land resources along waterfront zones controlled by terminal administrators, bookkeeping for more than 20,500 hectares (205 square kilometers). The most recent two decades has seen developing requirements over the advantages for agreeing on the development of worldwide creation systems also, the related logistical exercises. These benefits are troublesome and capital concentrated on growing (extra request) or supplanting (new site). It is in this way not amazing that the money related area has assumed a developing part of the business.

Figure 3 - Container Terminals of the World's Four Major Port Holdings, 2009

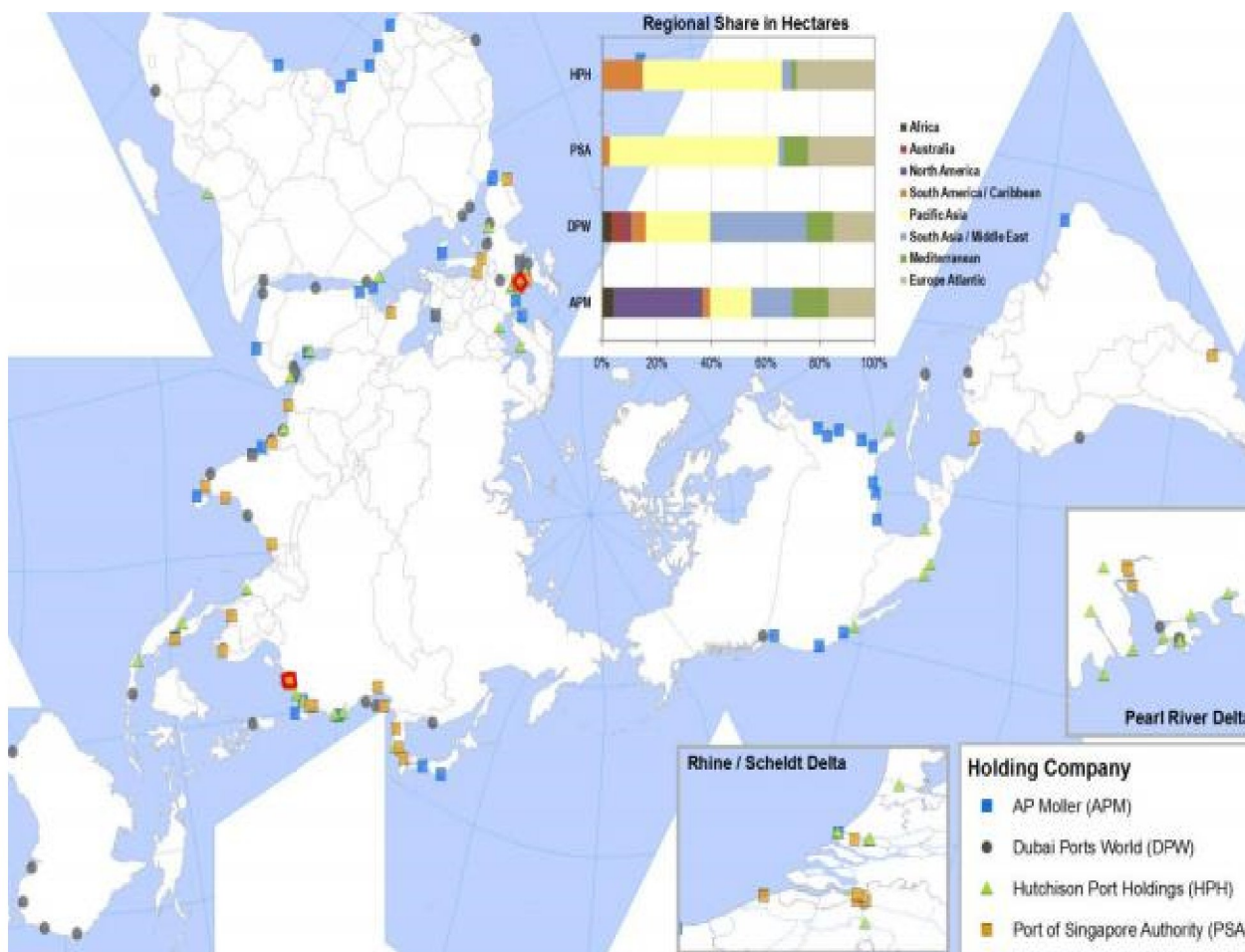


Figure 3

Source: Drewry (2008), Annual Review of Global Container Terminal Operators – 2008.

Four noteworthy port possessions have considerable worldwide resources of around 45 committed port terminals; APM Terminals (controlled by the Danish sea shipper Maersk), Dubai Ports World (DPW), Hutchison Port Holdings (Hong Kong), and the Port of Singapore Authority (PSA). Together, they controlled through different value stakes 179 committed oceanic compartment terminals in 2009. They are especially engaged along the world's primary business doors, for example, the Pearl River, Rhine/Scheldt Delta (Rotterdam and Antwerp) and the Delta (Hong Kong). Their resources are topographically broadened, with Pacific Asia being the principle center of HPH and PSA, Middle East and South Asia having DPW has all around spoken to and APM having a portfolio with a solid North American accentuation.

A few other port possessions exist, claimed particular by privately owned businesses. For example, SSA for North America or Euro-gate for Europe), by sea bearers (Hanjin and Evergreen have striking resources. and commercial property (Ports America claimed by AIG), yet their center is local, in any case, numerous have grown a broad worldwide portfolio.

A grouping of proprietorship among four noteworthy port possessions is occurring. In 2006 when DPW obtained the terminal resources of P&O (Peninsular and Oriental Ports) further combining its global property. Be that as it may, DPW was compelled to repeal the American resources of this exchange. The terminals in Baltimore, Miami, New Orleans, New York and Philadelphia to the holding AIG (Ports America) because of a political contention. A Middle Eastern holding company working the real American port terminals was seen adversely in the post 9-11 setting.

2.7.4 Competitive transport solutions

Scandinavia's biggest holder port lies in Gothenburg – the one and only in Sweden, which is common with the oceangoing vessels. The merchandise originates from all parts of the world – or is en-route there, either straightforwardly by sea ship or by feeder ship through the landmass. Skandia terminal has the capacity, to be in charge of the running of the compartment port, has extraordinary assets and skills to meet all the distinctive needs. Ten billets offer a water profundity of more than 14 meters and the port is open 24 hours a day, throughout the entire year. Holders can be released in 30 minutes of emptying. Quayside profitability for oceangoing vessels is no less than 100 units for each hour. There is an extraordinary spotlight on creating conveyance by other modes of transport especially rail and road. In addition to other things, there are 26 everyday rail associations between the port of Gothenburg and logistic areas in Norway and Sweden.

2.7.5 Joint effort Improves Efficiency

Gothenburg's oil terminal is Scandinavia's biggest general oil harbor. The harbor gives area to terminals and quays and hardware for stacking, emptying and bunkering oil. Ecological and wellbeing measures, and additionally the workplace, are likewise organized in the oil terminal. A large portion of all the unrefined petroleum to Sweden is emptied at Tor Harbor. Refined oil items, chemicals and a little measure of raw petroleum are stacked and emptied at the other two oil harbors, Skarvik, and Rya. Additionally found here are Sweden's

biggest port administrations, supplying the entire of western Sweden with so many things as petrol and diesel.

Ecological issues are a steady primary focus at the oil terminal, which directs a proactive natural cooperation with powers and the organizations that are dynamic in the port region. In addition to other things, this has added to forcefully decreased discharges of gas into the air. The close joint effort between the oil terminal and alternate players guarantees advancement and more noteworthy proficiency and efficiency of the ports and ports service. Three noteworthy refineries lie specifically to the neighboring port. The completed items are conveyed to both Swedish and remote markets. Other imperative client classes are the autonomous stockpiling organizations and other petrol organizations. The Port of Gothenburg is currently additionally a trans-shipment center for Baltic unrefined petroleum. Interval stockpiling in rock depressions and reservoirs contains synthetic items, petrol, renewable items, for example, ethanol and bio-oils, and other petroleum items. Gothenburg's topographical position and accessible limit create prospects of tolerating significantly more noteworthy travel volumes and keeping on being a considerable oil and vitality center for northern Europe.

2.7.6 Quick products turnover of moving freight

The terminal port of Gothenburg is portrayed by fast, adjusted merchandise turnover of moving payload in an aggregate of five terminals and 14 ro/ro quays. Boats to and from the landmass, incredibly cargo from Britain, Finland and Denmark are stacked and emptied with extraordinary exactness and quality in the streams of merchandise. There is a consistent specialized improvement to meet the ever more noteworthy requests for productivity from clients, where shorter lead times are vital. Together with the clients, aggressive transport, and logistics arrangements are developed with an emphasis on both general burden bearers and client adjusted intermodal*) streams of paper and steel. Älvsborg ro/ro capacity runs the ro/ro terminal and is an accomplice in these frameworks. Along these lines, the terminal and the port have an unmistakable part of the logistic chain. Another essential piece of the port's ro/ro administrations is the treatment of recently created vehicles over the quay, to both the trans-oceanic and European markets. Stena line, with its successive ro/pax activity, is likewise a noteworthy terminal administrator and has for a long time been an understood profile in the port of Gothenburg

2.7.8 Port Pricing

Port pricing in every region tends to depict that ports are originally seen as the providers of public infrastructure services especially when maritime and shipping logistics are concerned. Therefore, this directly implies that ports are open to any ship that docks. On the other hand, there hasn't been a clear tradition for managing the approaches to these ports. However, there is the essence of first come first serve irrespective of the revenue generated by an individual ship and this is particularly what determines the efficiency and choice of a port. Most ports are publicly owned, therefore, the authorities have incentives to reduce subsidies paid to the ports regardless of whether the ownership is regional, municipal or national. On the other hand, the port administrators have incentives that result in the increase throughput of the port. The port administrators therefore ensure that the cost of recovering these incentives is set during the determination of the port pricing. The element of the cost recovery can be depicted as the average cost pricing or the combination of the subsidies and charges. According to the research, the Norwegian port has been depicted to follow the traditional pattern and can therefore be listed as an example of the sophistication of the port services and traffic structures. The normal port will charge multiple tariffs structures which include port entry and berth charges depending on the size of the ship. This shows that there is minimal discrimination between both the short- sea and deep-sea vessels

2.7.9 How Port size affect the traffic coming into the port

The maritime shipping and transport industry is heterogeneous. It is therefore characterized by a wide range of cargo, diverse functions of vessels, various operational methods, and distinct contract arrangements and regulations. As a result of these, the port size plays a critical role in determining the size of the traffic flowing to the port. The traffic on the other hand has a direct influence on the efficiency of a particular port. According to the study, most freighters, forwarders, shippers, and logistic operators prefer an efficient port regardless of the size. However, due to the size of the cargo being docked at the ports makes the size of the port an important denominator. The diverse physical nature of the cargo leads to different design of the vessels that carry them and therefore will require different terminals or ports that can handle both the diverse nature of cargo and the kinds of ship. The handling and operational mode of the cargo is determined specifically by the value of cargo, type, and basically the quantity. On the other hand, the capital requirement of the vessel and its infrastructure is also a fundamental aspect to consider. Therefore, port size will duly affect the size of the traffic in a particular port.

The Hurtiguten line, i.e., the Norwegian coastal line and other maritime transport such as ferries to and from Norway plays a critical role in the traffic and therefore commonly attributed to market segments in the regions. According to the port statistics, from various ports there is available data for the shipping operations statistics in terms of the number of ships that docks a particular port. Based on this, Norway produces annual statistics on the ships that docks the individual ports including the number and size of the containers that arrives and are registered in a particular port. The Norwegian ports including Spitsbergen have recorded a significant increase in the shipment traffic from 2006 to 2015. This therefore means that the traffic in this region has increased tremendously and therefore calling for the need of port efficiency and increase in the size of the port in order to curb the increasing traffic flow.

2.7.10 Operation and cost structure of the maritime transport

The mode of operation in maritime transport and logistic is an important factor to consider in analyzing the operation and the cost structure of maritime transport. This is because it depicts the decisions that are based on all aspects of the entire shipping process. In considering the mode of operation, the shipping industry is typically divided into three categories namely, linear shipping, tramp shipping and industrial shipping. According to the study conducted on the Norwegian ports, it can be said that it is difficult to categorize the shipping industry into neat unambiguous components because of the market fluctuations. This is because, the shipping companies operating in the Norwegian ports and UK ports does not participate in only one commodity but rather they participate in more than one commodity market. On the other hand, the shipping companies also switch between the operating modes.

2.7.11 Liner shipping

This is a service that provides a constant service at regular intervals between predefined named ports and uses a common carrier or vessel of any cargo requiring shipment shipping service between those predefined routes. This kind of cargo is already for transit by this particular vessel's published dates and therefore the rate of using these linear services is fixed by the shipping company.

2.7.12 Tramp shipping

This is a contract based service in which the shipping company provides services to only selected clientele who have relatively large volumes of cargo to be transported. In this particular case, the carrier and the shipping company negotiate and agree on the shipping

rates. In most instances, one voyage usually carries commodities for one shipper. This kind of service satisfies the demand for spot transportation and therefore do not have a fixed itinerary for a long period.

2.7.13 Industrial shipping

This is also commonly referred to as the special shipping. This kind of service is characterized the shipping company running on regular routes by the use of specialized vessels for specific cargo. Big industrial organizations with large volumes of cargo in form of raw materials, or input materials and or products or output products utilize this kind of service. OPEC (Organization of the Petroleum Exporting Countries), for instance is a clear cut example of a big organization using this particular kind of shipping service. Therefore, this service represents the major and dire demand for industrial shipping. In most cases in the developed countries, especially in the UK, industrial companies usually cooperate and provide their own fleet or they may as well lease the fleets for a long period in order to transport their cargo.

The mode of operations and the cost structure in the Norwegian port is inter-determined. The cost allocation is highly distinct for various modes of operations. In this case, the cost can therefore be divided into three sections, namely, capital cost, operational cost and finally the voyage cost. The capital cost, also referred to the overhead cost include the cost of purchasing ships, either new or second-hand. Operational cost includes insurance, manning, repairs and, maintenance, handling cost, and all other cost that is associated with the ship. The voyage cost includes bunkers, port and canal dues, and seaway costs.

Chapter 3.

Research methodology

3. 0 Introduction

This chapter forms the blueprint of how the research was conducted. It describes the research design, population of the study, data collection and data analysis techniques.

3.1 Research Design

The study was conducted using qualitative descriptive research design (Bryman & Bell, 2011). Descriptive survey research seeks to obtain information that describes existing phenomena by asking the shipping companies, freighters and forwarders about their perceptions, attitudes, behavior, and their decision making process in choosing a particular port terminal. Descriptive survey suited this study because the population in question is large and it is difficult to observe the characteristics of each particular port terminal's competitiveness. It will also help in collecting original data port competitiveness. Descriptive research design was chosen. This study aims to generalize the findings to the Norwegian port competitiveness and productivity. For the interviews, the accompanying performing participants (a sum of 6) were chosen:

1. Shipping organizations;
2. Terminal administrators;

Top line managers were interviewed for the survey covering among others 3 transportation lines that work 15.7% of the world armada of compartment vessels.

3.1.1 Population of the Study

The population of the study was conducted mainly at the two leading ports of Drammen and Oslo port terminals in the maritime transport industry. This study operationalized Norwegian ports as the major maritime terminal in the supply chain.

3.1.2 Data Collection Methods

The study used primary data sources for the purpose of collecting data. Primary data sources were used as they exude scientific basis as primary data are non-manipulated. Primary data was collected using semi-structure questionnaires. The study used questionnaires owing to the ease with which it gathers information and ease of analysis as they are standardized. The questionnaires were administered to the targeted sample. The questionnaires contained open and close-ended questions. Using five-point Likert scale, the respondents were asked to indicate their views on competitive strategies and their effect on performance.

3.1.3 Pilot testing of instruments

In order to ascertain if the research instrument was functional, the questionnaire was first tried out on 2 respondents. This is to ensure that every respondent sampled will not only understand the questionnaire, but also all respondents understand the questionnaire the same way. Moreover, this helped in testing the respondent's comfort in answering the questionnaire. On the other hand, it also helped in approximating the time entire research will take.

3.1.4 Validity of research Instrument

Validity is the degree to which the research instruments accurately provide measures the data collected. In order to determine if the research instrument was to measure what is intended to be measured; validation strategies was borrowed from relevant authorities including consultations with the research supervisors who have the expertise in the area of research. Their inputs were incorporated in the instruments before the actual data collection.

3.1.5 Reliability of Instrument

Reliability is the degree of consistency of the research instrument which measures whatever it is intended to measure or how it yields consistent results over a number of repeated trials. The reliability of questionnaires was established through the test-retest procedure. Questionnaires were first tested in five randomly selected shipping companies, freighters and port terminals not in the study sample. A period of two weeks was allowed before the tools are retested. Sampled responses from the test and the retest will be analyzed using means, frequencies and percentages that will produce scores which will enable the determination of the consistency of the processes and if the process will yield consistent results. The relationship between the first and the second test was found to yield a highly positive correlation. This procedure helped in modifying and removing a few weaknesses and hence produces a revised instrument which will be used in the actual study.

3.1.5 Data Analysis

Descriptive analysis method was used to analyze the primary data. This was in a form of structured questions. Percentages were therefore used.

3.1.6 Ethical consideration

Before the beginning of the study, the researcher sought permission from the relevant authorities. A letter of introduction was sought from the university. The researcher explained to the respondents the purpose of the study before engaging them. It also described how the results of the study would be important to them. The respondents were also assured that the information they provided was for the purpose of the study, and their identity would be treated with utmost confidentiality.

3.1.7 Interviews

The information given by respondents from shipping organizations empowered this research study to decision makers in port determination. It also enabled the assessment of the significance of every port choice foundation for transportation organizations as a result of their individual competitiveness of the chosen set of ports in Europe and to check their engaging quality. Similarly, the organization's present streams are mapped, and knowledge is picked up in the development of their future stream structure. At last, an assessment by transportation organizations of the significance and the score on distinctive attributes of hinterland transport modes will be completed.

The data given by terminal administrators empowered recognized leaders in port selection, assessing the significance of every selection standard for venture purposes, and acquiring comparative data on the port determination by their clients due to the port's competitiveness. Assessment of perceived ebb and flow and future characteristics of a chosen set of seaports in the respondents' sentiment, split among terminal administrators themselves, and additionally by their clients. Estimation was additionally made without bounds advancement of transporters' systems, which importantly affects port intensity and subsequent port efficiency and competitiveness. From the interviews with shippers, information on the significance of transport administration and determination criteria was acquired. The execution of transportation administrations or transportation modes was also assessed. Perceived present and future characteristics of chosen ports were distinguished from the outcomes. The questionnaire among logistics gatherings permitted the assessment of transport arrangements, port choice, and criteria that the choices depended on. Moreover, from the perspective of logistic gatherings, perceived present and future characteristics of

transport modes were recognized. The same was valid for seaports when the logistics administrator was included.

At last, the motivation behind the questionnaire among logistic users was to assess the significance of the distinctive area and the criteria of choice for primary classes which included seaport availability, client openness, area, and value of port services, building/rental cost, and financial strategy. Distinctive areas of Europe and specifically Norway were looked at in their scores on the diverse variables. The EDC business sector is additionally mapped by social affair data on movement courses through EDC's logistics chains.

3.1.8 Empirical analysis

During empirical analysis of data derived from the questionnaires, first, a summary of data was generated through thematisation of questionnaire results and through graphical representation of the statistically tested and tabulated data. Secondly, the findings was comprehensively interrogated and appraised by relating them with relevant literatures. A regression analysis was conducted. Thirdly, the findings of the results were theorized and explained

3.1.9 Research problem

The efficiency in services delivery process is key in determining the competitiveness of a port terminal. With the ever dynamic maritime industry, port terminals need to respond effectively to the key variables such as Pricing, performance and technological advancement that determine their competitiveness in the maritime industry. With the rapid changes in shipping company's and freighters and forwarders', preferences and increased competition, there is a need for port terminals to focus attention on the competitive strategy more than ever before. Competitive strategy determines to a great extent the success of a port terminal amid competition.

Strategy development and implementation is an intricate process that requires co-ordination and input of key departments and individuals. Maritime transport industry has its battles to fight, the quest to lead and maintain leadership in the market notwithstanding. This study established that competitive strategies should be used by port terminals to attract shipping companies, forwarders, and withstand competitive pressure. Vickerman study established that the maritime transport and supply chain find difficulties, value, inability to be imitated and inability to be substituted as a competitive advantage and rather focus on cost minimization.

Given that the intensity of competition in the maritime transport industry is increasing and the nature of this competition changing, it is important for all stakeholders to gain knowledge on how best to employ competitive strategies within it in a bid to improve the performance, efficiency, productivity and survival of their port terminals.

Several studies have been done in the maritime transport industry, John Vickerman's work focused port competitiveness in the global perspective, and Olaf Mark's work in Oslo focused on the competitiveness of the global port-cities. Ning Lin's work conducted research on the port performance, the models and metrics supporting the performance evaluation. This research is based on the Norwegian port competitiveness and productivity and efficiency of the Norwegian port. It also focuses on other factors that influence decision makers in choosing a particular port in the Norwegian region. This, therefore, means that this research is relevant as it has covered areas that had not been exploited before and, therefore, has helped a great deal in reducing the knowledge gap that exists in the maritime transport industry.

3.2 Criteria in Selecting Transport Results

To assess the significance of port choice criteria for transportation organizations during the interviews, the interviewees displayed a rundown of port choice criteria and requested that rank them and give remarks on them. Essential criteria and significance for transportation organizations are quality, the cost of hinterland associations, limit, unwavering quality, port area (adrift or inland) and load base. Criteria of a lower significance are adaptability, client administration quality, area in port (if locks should be utilized), and absolute door-to-entryway transport time and feeder recurrence. The risk of misfortune/harm is of low significance. The cost measure specified here are the out of pocket costs that are connected with the decision of a particular port by a transportation line. Transportation organizations remark that a choice to call at a port can't be made without accessible load from/to that port, which is firmly connected to ports' topographical area and the range that can be served through it. Additionally, an inland port area is perceived as a preference by transportation organizations, because it permits for chain cost savings.

In assessing hinterland transportation administrations or hinterland transport modes, by a long shot, the essential model is the expense. After that come dependability, recurrence of administration, adaptability, and aggregate way to-entryway transport time and client

administration quality. Ecological effect and danger of misfortune/harm are of low significance. The vehicle mode or an arrangement of transport modes that is utilized is picked chiefly by considering the destination that must be served, the estimation of products, time requirements, and the expense. The environmental effect of a vehicle mode is gradually picking up significance, fundamentally due to government arrangement with for example disguise of external expenses.

Chapter 4.

4.0 Findings.

During the interviews, the total 6 respondents were requested to assess the criteria shipping companies, freighters and forwarders use in selecting the use of particular port terminal. The independent variables that were applied were, pricing, hinterland connectivity, size of the port terminal, efficiency, technological innovations, port capacity, port location, customer service, and risk of loss and damages. The results were tabulated from the most agreeable, agreeable disagree, most agreeable. The percentage of the respondents was then tabulated. Table one below show the results.

TABLE 1

Independent variable	Most agreeable	Agreeable	Disagree	Strongly disagree
Connection to hinterland	83% 5 out of 6 respondents	17% 1 out of 6 respondents	0% 0 out of 6 respondents	0% 0 out of 6 respondents
Pricing	49% 3 out of 6 respondents	34% 2 out of 6 respondents	17% 1 out of 6 respondents	0% 0 out of 6 respondents
Size of the port	17% 1 out of 6 respondents	66% 4 out of 6 respondents	17% 1 out of 6 respondents	0% 1 out of 6 respondents
Technology use	66% 4 out of 6 respondents	34% 2 out of 6 respondents	0% 0 out of 6 respondents	0% 0 out of 6 respondents

Port location	34% 2 out of 6 respondents	33% 2 out of 6 respondents	33% 2 out of 6 respondents	0% 0 out of 6 respondents
Efficiency of the port	83% 5 out of 6 respondents	17% 1 out of 6 respondents	0% 0 out of 6 respondents	0% 0 out of 6 respondents
Customer service	34% 2 out of 6 respondents	49% 3 out of 6 respondents	17% 1 out of 6 respondents	

Table 1

4.1 Connection to hinterland

The above results from the respondents clearly illustrate the criteria that the shipping companies, freighters and forwarders use in selecting a particular port terminal. The above variables also directly affect the competitiveness of a particular port terminal. 83% of the respondents concurred that connection to hinterland was a criteria used in selecting a particular port terminal. 17% also agreed to the same while only 0% disagreed that connection to hinterland affected their decision in selecting a particular port terminal from the above results, it is then clear that for a port to be competitive, there has to be proper connection to hinterland.

4.2 Port pricing

From the results obtained from the respondents, it was clear that port pricing played a crucial role in decision of the shipping companies, freighters and forwarders in selecting a particular port terminal. 49% clearly showed that port pricing was a variable that was most agreeable, 34% of the respondents agreed that port pricing was a variable they considered when selecting a particular port terminal. This therefore indicated that for a port terminal to be competitive there has to be a cost effective and budget oriented pricing strategy that should be applied. Port competitiveness is therefore determined by its pricing structure. From the port operators they mentioned on the side that their pricing was a bit similar, the

port in Drammen offered longer days stay as against the port in Oslo which needed the port user to evacuate their goods at a quicker rate.

4.3 Use of technology

66% of the respondents gave a most agreeable response when it comes to the use of technology by port terminal. This clearly indicated that for a particular port to be competitive in the maritime transport industry there is a dire need to use modern technology as this directly increases the efficiency of port in handling cargo. It also increases that annual container throughput of the port terminal.

4.4 Port location

Port location did not seem to be a variable that was considered the most with only 30% of the respondents providing most agreeable results. However, the efficiency of Drammen port terminal was a variable that was mostly considered by the respondents in the selection of a particular port terminal. This clearly indicates that port competitiveness is directly affected by its efficiency in cargo handling. The respondents from the port in Drammen attributed some of their business success to the location and proximity of the port. The operators of the port in Oslo also added the new links to E6 that takes cargo the terminal in Alnabru as a significant factor that affect the choice of Oslo.

From the above table, it is clear that cost plays a critical role in port choice decision making by the shipping companies and forwarders. Moreover, shipping companies also prefer a port with good hinterland connectivity, port capacity/size and the location. The quality of service offered by the port terminal is also crucial in determining the competitiveness of a port terminal.

4.5 Port competitiveness

In this segment, we will contrast the port choice criteria with Norwegian port execution on those criteria to decide the similar level of execution of each of the ports. In the past area, Table 1 indicates what the port terminals get for each of the distinctive variable. The relative significance of the variables used in the selection of port terminals by shipping companies, freighters, and forwarders directly affects the competitiveness of a port terminal.

Port terminal connectivity to hinterlands is essential for port terminal competitiveness.

This is because the connectivity also determines the frequency of shipping services. Port terminals with extensive hinterland connectivity are more attractive to shipping

companies, freighters and forwarders as these terminals can offer direct services and effectively efficient delivery of goods. If sufficient volume of goods is shipped through these port terminals, there will be higher frequency of shipping services at the ports and thus greater reliability can be guaranteed thus increasing the port's competitiveness. Maritime connectivity provide a competitive advantage for port terminals and thus attracts additional shipments, hinterland connectivity is there for an independent variable in affecting the port competitiveness

4.6 Differentiation strategy

A differentiation strategy is the development of a product or service that are of unique attributes that provides customers with value addition and that customers perceive the provider to be better than or different from competitors. From the study, it was depicted that for ports to be more competitive, there are certain differentiation strategies that ports apply, this include excellent customer service, security and technological innovations. Port terminals strive to improve their service delivery in order to be competitive. As determined by the study, different marketing strategies, cost reduction strategies and advertisements were applied by different port terminals in order to be competitive. Cost leadership was also applied by the port terminals in order to give clients the most competitive price in the market. Annual container throughput also plays a critical role in determining the port competitiveness, the higher the container throughput of a particular sea port, the competitive the port terminal.

4.7 Decision-makers in Transportation

The answers from the questionnaire were provided by mostly line managers with specific roles relating to operations and traffic management. This gave an extraordinary insight into business techniques that every port terminal was utilizing. Moreover, some broad conclusions were also drawn. The forwarders, shipping companies and freighters constantly made port terminal choice; in any case, as remarks obtained during the interviews demonstrated. These decisions were affected by topographical contemplations, i.e. The scope of customers that can be served through that port, connections to specific destinations, and so forth. Recently, there has been a pattern that the huge shippers turn out to be concerned in the choice on seaport choice as a result of their expanded significance in the business sector. At the individual shipment level, the forwarder, the sender, and beneficiary played a critical role in the seaport choice.

In selecting the transportation mode or solution, an essential part is played by the forwarder and the sender of the payload. On the other hand, the delivery organization also takes part in settling on the choice of the port. Logistics/transport suppliers much of the time are chosen by the forwarder or sender, and just in some business situations, it is made by the delivery organization or collector of the merchandise.

Chapter. 5

5.0 Research Discussion

The container ports in Norway are distributed across the country because Norway is sparsely populated (Schøyen et al, 2013). Moreover, the vessels that are en-route to these ports are relatively smaller and, therefore, are the feeder types. The large sea container ships do not frequent these ports. With this reason, therefore, the small and medium size ports are primarily categorised as the gateway and a link to the supply chain in the Norway maritime shipment. The Norwegian ports' performances as compared to other international ports perform relatively better than all the other Nordic nations. However, they are only outperformed by the UK ports. On the other hand, the Norwegian ports are more efficient and competitive than the ports of other Nordic nations. For example, Oslo, the largest container port in Norway is the highest performing port in the region. Moreover, the Norwegian ports also reflected high productivity from one period to the next as compared to other ports in the region (Schøyen, 2013)

5.1 Limitations of the Study

The main objective of the study was to identify the ports competitiveness, their productivity, efficiency and performance. Norwegian ports and the challenges they face that affects the port's throughput. There were some limitations for this study. First, the study included only a small portion of the large population of maritime transport industry because of time limit. Second, the competitiveness pursued by port terminals and maritime supply chains in other areas globally as well as the challenges they face could be quite different as opposed to the Norwegian port terminals. Third, the study did not identify reasons why strategies fail in their implementation stage. Finally, I encountered other challenges such as non-cooperation by some of the respondents targeted for fear that information might be used for other purposes other than for academic purposes despite the assurance by the researcher that the findings would be used solely for the intended purpose hence not reaching the targeted sample size.

5.2 Recommendations of the Study

The study recommends that for port terminals in the supply chains to overcome competition from other ports, new entrants, social reforms, technological advancements and globalization challenges, entire port authorities should emphasize on various competitive

strategies to ensure that they are focused towards the organizational objectives and aligned to the need of the market environment. Further the study recommends that port terminals in the Norwegian area should re-look on their competitive strategies in terms of expanding their services in order to reach the ever dynamic maritime transport industry and also focus on increasing port as well as creating awareness of various services they offer. The port authorities, partners and managers need to develop and adopt strategies that will ensure survival of their port terminals in the maritime industry and make it a priority. The port terminals should know that customer satisfaction always comes first. The study also recommends other imperative competitive strategies that may be applied by the port terminals which include diversification of product lines, expansion to new markets as well as efficient and timely service delivery to customers. In terms of port pricing, the ultimate aim of future research is to propose more effective pricing schemes so as to facilitate the decision making of particular ports regarding the choice of maritime transport terminal and thus enhancing the competitiveness of the port terminals.

In (Lin, 2013) , in that study, the port of Oslo is among the five Norwegian ports which is perceived as specifically important in the growth of efficient and safe for maritime transport with regards to passengers and goods. It is a state of the earth port terminal operating 24/7 with a small distance between the port terminal and road network. It is also an interjection in the Norwegian maritime transport with great number of vessels that call the Oslo port terminal. Moreover, the Oslo port authority is the managing body of the Oslo port. Further insights and observation from that study suggested we observed similarly that the storage area available for containers in Oslo port is a bit limited, which I stressed that Drammen provided more ample storage space and longer duration for containers at its facilities in that same study Lin also mentioned labour issues in the port of Oslo as a concern for the operators. That was a concern echoed by of the interviewees as labour issues are hampering the smooth operations at the port of Oslo, which was not a concern at the port of Drammen. Pricing was also a topic touched by the said research, which we both on the same page about. The author also encouraged further research into how companies can better share supply chain information to improve their performance.

Chapter 6

6.0 Research conclusion

Research question 1

How are traffic and container throughput factors that impacts on the competitiveness of the most important Norwegian ports?

To answer this question we conducted a literature review to identify how traffic and container throughput impact on the performance of port and terminals. The productivity of these specific terminals were assessed in literature reviewed in this thesis work, measuring ports' historical performance, thereby exploring whether Norwegian port terminals have been improving their performance over a given period.

Research question 2

Have Norwegian ports improved their competitiveness in the present years?

It is clear that the difficulties that the ports are confronted with as a part of the logistics chain are quite enormous. The most vital criteria that the ports need in an attempt to enhance their competitiveness have been talked about in this paper. An audit of significant literature sources and additionally arrangement of meetings with different line managers added to the examination, the line managers were a spread comprising various stakeholders like the head of a terminal operation, traffic and operational managers from the ports, consultants and a chartering broker for a liner company. A reasonable progressive structure of port determination criteria can be gleaned from the various interactions with stakeholders. The meetings affirmed the after-effects of the literature audit. The most vital rule ends up being the expense as can be seen from meeting results. However, additionally other criteria like nature of Norwegian and Scandinavian connections, port limit and unwavering quality are a territory that port powers can and ought to consider impacting so as to enhance the competitiveness level of a port. By and large, every one of the speculations is seen absolutely by the delivery lines. On the other hand, additional interests in limit won't enhance the scores that a port gets. The issue may lie somewhere else, so the structure of these scores is critical. The methodology portrayed in this paper permits recognizing the shortcomings of a port;

consequently proper measures can then be taken to handle these issues. The methodology taken in this study is adequately broad to be utilized as a system for a more broad examination, potentially on an alternate arrangement of ports. The after-effects of this study are of high significance to the port powers that are always managing how to handle their port's competitiveness.

The study examined the competitiveness of Norwegian ports. It also included other holder ports situated in the other Nordic nations and a slight mention of U.K ports, particularly those that are equivalent to the Norwegian ones taking into account the accessibility of information. This has made it conceivable to measure the general execution of the Norwegian holder ports and how competitive they are. Some of the fundamental information utilized were also obtained from the CIYs which were from the works of (Schøyen et al, 2013), which is the database often used by researchers to survey the competitiveness of port terminals. All Norwegian ports work with expanding scale, aside from Oslo, without a doubt, Norwegian ports need to build their working scale so as to wind up scale effective because it gives the idea that they are too little in connection with the undertakings that they perform. This will enhance the port's individual competitiveness

However, some alert must be taken when interpreting the consequences of this study. There were a couple of perceptions from every nation incorporated into the concentrate; thus, the determined scores may not recount the full story of the ports of every individual nation. The ports incorporated into the study were chosen on the premise of their likeness to Norwegian ports; accordingly, what is of interest is the execution of Norwegian ports with respect to the wilderness made out of these ports.

Port pricing is also a very complex matter. It is an area that is currently lacking in transparency. This might explain why little research has hitherto been devoted to trying to understand the structures underlying port pricing strategies and the behavior of the decision makers. This paper also presents port pricing and some factors that determine the pricing structures of a particular seaport including calling cost, terminal-handling cost and concession cost. These structures are rather linear in nature, and they tend to ignore modern pricing tools proposed in the literature. On the other hand, they are not linked directly to traditional pricing approaches such as price differentiation or the.

I can conclude that there has been a large scale improvement in the ports as regards their operations over the years and the interviewees made it clear to me that there is a

deliberate plan by port operators for continuous improvement of services to enable them compete better with increasing competition.

6.1 Recommendations for further research.

Further research can be suggested or followed on the same topic but with more resources and time, to enable a larger sample size, to see if the prognosis and outcome will eventually be the same as mine. This is because my data and sample size were largely restricted to Oslo and Drammen areas, that is why am been careful not to generalize the outcome of the research as been representative of the entire Scandinavia and Europe as a whole.

Appendix II: Questionnaire

The purpose of this study is to establish port competitiveness and productivity which influence the port's throughput in the Norwegian terminals. Your participation is key to the success of this study. Your response will be treated with utmost confidentiality. You are therefore highly encouraged to participate in this study.

Instructions: *(Please read the instructions given and answer the questions as appropriately as possible).* It is advisable you answer or fill in each section as provided. Make an attempt to answer every question fully and correctly. Please provide honest and candid answers to the questions. Your name is not required in the questionnaire

SECTION A: GENERAL INFORMATION

1. Name of the Norwegian port terminal.....

2. What is the legal name of the Norwegian port?

- a) Partnership ()
- b) Public Limited Company ()
- c) Private Limited Company()
- d) Other ()

3. What is the number of years the port terminal has been in operation?

- a) 0-10 Years ()
- b) 11-20 Years ()
- c) 21-30 Years ()
- d) Over 31 Years ()

4. What is the annual container throughput of the port terminal/TEU?

- a) Below 10 Million ()
- b) 15 Million- 25 Million ()
- c) 26 Million-50 Million ()
- d) Over 50 Million ()

5. What is the number of employees in the port terminal or port related services?

- a) Below 500 ()
- b) 501-1000 ()
- c) 1001-2000 ()
- d) Above 2001 ()

SECTION B: PORT COMPETITIVE STRATEGIES

Competitor within the maritime industry. Which firm or services do you consider a threat?

Type of competition	Frequency	Percentage (%)
Weak competition		
Strong competition		
Very strong competition		

Differentiation strategy. What distinguishes you as a brand from competitor

8. To what extent does your port terminal use differentiation strategy in a bid to remain competitive? (please tick one)

- a) To a very large extent ()
- b) To a great extent ()
- c) To a moderate extent ()
- d) To a little extent ()
- e) To no extent ()

9. Rate the level of application of the following differentiation strategies in your port terminal by placing a check mark in the appropriate box in a scale of 1-5. where 1=to no extent; 2=little extent; 3=moderate extent; 4=great extent; 5=very great extent)

	1	2	3	4	5
Product Pricing below competitors					
Strategic Location to Customers					
Unique Customer Service					
Offer different Products/Services					
Innovation					

Focus strategy. Your winning edge!

10. To what extent does your port terminal use focus strategy in a bid to remain competitive?(please tick one)

- a) To a very large extent ()
- b) To a great extent ()
- c) To a moderate extent ()
- d) To a little extent ()
- e) To no extent ()

11. To what extent do the following inform focus strategies in port terminal? Please rate in a scale of 1-5 by placing a check mark in the appropriate box. where 1=to no extent; 2=little extent; 3=moderate extent; 4=great extent; 5=very great extent.

	1	2	3	4	5
Focus on shipping companies and fowarders					
Devoting resources to maintain market leadership in this niche					

Innovate specific equipment and technological products for the port terminal					
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Cost Leadership Strategy

12. To what extent does adoption of cost leadership as a competitive strategy affect the performance, competitiveness and productivity of the port?(please tick once)

- a) To a very large extent ()
- b) To a great extent ()
- c) To a moderate extent ()
- d) To a little extent ()
- e) To no extent ()

13. To what extent do you use each of the following cost leadership options in response to changes in the market? Please rate by ticking the appropriate box in a scale of 1-5 where (1=to no extent; 2=little extent; 3=moderate extent; 4=great extent; 5=very great extent).

	1	2	3	4	5
HSN University College of Southeast Norway					
Continuously cutting cost across maritime value chain					
Use knowledge from past experience					
Outsourcing and increased automation					
Exploiting all economies of scale					
Operating facilities at full capacity					
Maintaining overheads lower than industry					
Providing services at a low cost but of superior quality					

Section C: Challenges in Competitive Strategy Implementation

14. What are the challenges faced by your port terminal and shipping company in implementing the formulated competitive strategies?

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THANK YOU FOR YOUR RESPONSE AND COOPERATION

References

- Al-Eraqi, A.S., Mustafa, A. and Khader, A.T. (2010) an extended DEA windows analysis: Middle East and East African seaports. *Journal of Economic Studies* 37(2): 208–218.
- Bird, J. and Bland, G. (1988) *Freight forwarders speak: the Perception of Route Competition via Seaports in the European Communities Research Project*. Part 1. *Maritime Policy & Management* 15[1], 35-55. Routledge.
- Branch, A.E. (1986) *Elements of Port Operation and Management*. London, Chapman and Hall Ltd.
- Bryman, A., & Bell, E. (2011). *Business Research Methods* (3rd ed.). London: Oxford University Press.
- Cullinane, K. and Khanna, M. (2000) Economies of scale in large containerships: Optimal size and geographical implications. *Journal of Transport Geography* 8(3): 181–195.
- Cullinane, K., Teng, Y., and Wang, T.F. (2005) *Port competition between Shanghai and Ningbo*. *Maritime Policy & Management* 32[4], 331-346. Routledge.
- Cullinane, K.P. and Wang, T.-F. (2006) The efficiency of European container ports: A cross-sectional data envelopment analysis. *International Journal of Logistics Research and Applications* 9(1):19–31.
- De Langen, P.W. (2007) *Port competition and selection in contestable hinterlands: the case of Austria*. *European Journal of Transport and Infrastructure Research* 7[1], 1-14.
- De Martino, M. and Morvillo, A. (2008) *Activities, resources and interorganizational relationships: key factors in port competitiveness*. *Maritime Policy & Management* 35[6], 571-589. Routledge.
- Estache, A., de la fe, B. T. & Trujilo, L. (2004). Sources of Efficiency Gains in Port Reform: a DEA Decomposition of Malmquist TFP Index for Mexico. *Utilities Policy*, Vol. 12, No. 4 pp221-230.
- Frankel, E.G. (1992) *Hierarchical logic in shipping policy and decision-making*. *Maritime Policy and Management* 19[3], 211-222.

- Gibson, B., Sink, H., and Mundy, R. (1993) *Shipper–Carrier relationship and carrier selection criteria*. The Logistics and Transportation Review 29[4], 371- 382.
- González, M. and Trujillo, L. (2009) Efficiency measurement in the port industry: A survey of the empirical evidence. Journal of Transport Economics and Policy 43(2): 157–192.
- Grosso, M. and Monteiro, F. (2008) *Relevant strategic criteria when choosing a container port - the case of the port of Genoa*. European Transport Conference 2008.
- Guy, E. and Urli, B. (2006) *Port Selection and Multicriteria Analysis: An Application to the Montreal-New York Alternative*. Maritime Economics and Logistics 8[2], 169-186.
<http://hdl.handle.net/11250/153624>
- Kumar, S. and Vijay, R. (2002) *An Analysis of intermodal carrier selection criteria for Pacific-rim imports to New England*. Journal of Transportation Management 13[1], 19-28.
- Leachman, R.C. (2008) *Port and modal allocation of waterborne containerized imports from Asia to the United States*. Transportation Research Part E: Logistics and Transportation Review 44[2], 313-331.
- Lirn, T.C., Thanopoulou, H.A., Beynon, M.J., and Beresford, A.K.C. (2004) *An Application of AHP on Transshipment Port Selection: A Global Perspective*. Maritime Econ Logistics 6[1], 70-91. Palgrave Macmillan Ltd.
- Malchow, M. and Kanafani, A. (2001) *A disaggregate analysis of factors influencing port selection*. Maritime Policy & Management 28[3], 265-277. Routledge.
- Malchow, M.B. and Kanafani, A. (2004) *A disaggregate analysis of port selection*. Transportation Research Part E: Logistics and Transportation Review 40[4], 317-337.
- Meersman, H., Pauwels, T., Van de Voorde, E., and Vanelslender, T. (2008) *The relation between port competition and hinterland connections: the case of the 'Iron Rhine' and the 'Betuweroute'*. Conference proceedings of the International Forum on Shipping, Ports and Airports (IFSPA).

- Meersman, H., Van de Voorde, E. and T. Vanelslander, (2012). Port Congestions and Implications to Maritime Logistics, in: Song, Dong-Wook and Photis Panayides. *Maritime Logistics: Contemporary Issues*, Emerald, UK p. 49-68.
- Murphy, P.R. and Daley, J.M. (1994) *A comparative analysis of port selection factors*. *Transportation Journal* 34[1], 15-21.
- Murphy, P.R., Daley, J.M., and Dalenberg, D.R. (1992) *Port selection criteria: an application of a transportation research framework*. *Logistics & Transportation Review* 28[3], 237-255.
- Ning L. (2013). *Port Performance: Models & Metrics Supporting Performance Evaluation*. Molde University College. =
- Nir, A.S., Lin, K., and Liang, G.S. (2003) *Port choice behaviour - from the perspective of the shipper*. *Maritime Policy & Management* 30[2], 165-173. Routledge.
- Notteboom, T.E. (1997) Concentration and load centre development in the European container port system. *Journal of Transport Geography* 5(2): 99–115.
- Notteboom, T.E. (2010) Concentration and the formation of multi-port gateway regions in the European container port system: An update. *Journal of Transport Geography* 18(4): 567– 583.
- Odeck, J. and Bra °then, S. (2012) A meta-analysis of DEA and SFA studies of the technical efficiency of seaports: A comparison of fixed and random-effects regression models. *Transportation Research Part A: Policy and Practice* 46(10): 1574–1585.
- Panayides, P., Maxoulis, C., Wang, T.-F. and Ng, K. (2009) A critical analysis of DEA applications to seaport economic efficiency measurement. *Transport Reviews* 29(2): 183–206.
- Schøyen, H. and Odeck, J. (2013) The technical efficiency of Norwegian container ports: A comparison to some Nordic and UK container ports using Data Envelopment Analysis (DEA)
- Slack, B. (1985) *Containerization, inter-port competition, and port selection*. *Maritime Policy & Management* 12[4], 293-303. Routledge.

Song, D.W. and Yeo, K.T. (2004) *A Competitive Analysis of Chinese Container Ports Using the Analytic Hierarchy Process*. Maritime Econ Logistics 6[1], 34-52. Palgrave Macmillan Ltd.

Statistics Norway. (2011) Maritime transport statistics. [Internet] Available at:
[http://www.ssb.no/havn_en/\(read: May 2011\)](http://www.ssb.no/havn_en/(read: May 2011)).

Tiwari, P., Doi, M., and Itoh, H. (2003) *Shippers' containerized cargo transportation behaviour in China: a discrete choice analysis*. Journal of Transportation Economics and Statistics 6[1].

Tongzon, J.L. (1995) *Determinants of port performance and efficiency*. Transportation Research Part A: Policy and Practice 29[3], 245-252.

Tongzon, J.L. (2009) *Port choice and freight forwarders*. Transportation Research Part E: Logistics and Transportation Review 45[1], 186-195.

Ugboma, C., Ugboma, O., and Ogwude, I.C. (2006) *An Analytic Hierarchy Process (AHP) Approach to Port Selection Decisions - Empirical Evidence from Nigerian Ports*. Maritime Econ Logistics 8[3], 251-266.

Vickerman, J. (2015). *Port Competitiveness In the New Global Economy*. (2. Ed.). Renaissance Houston Hote. Norfolk. Virginia.