Strategies for Improving Container Throughput Market Share of Tanjung Perak Port: A Study on Port Competition Perspective

Netherlands Maritime University
Master of Shipping and Transport

Master Thesis
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2014/2015
Abstract

The amount of container throughput at Tanjung Perak port has been increasing each year due to economic growth in Indonesia. However, the container throughput growth was unable to increase the container throughput market share at Tanjung Perak port, apparently the market share has been decreasing continuously since 2009. Market share development is important to gain more economies of scale and market power. If the market share of Tanjung Perak Port in container sector successfully increases, IPC III as a main terminal operator in Tanjung Perak port will obtain more profit from containers handling activities. Furthermore, the economy in East Java region will be successfully improved. Therefore, the aim of this research is to find a strategic solution to overcome the downward of Tanjung Perak container throughput market share.

This thesis has been developed according to the literatures related to port development and port competition in order to create a strong foundation for the analysis. Finding indicates that determining relationship strategies toward ports in proximity is important, and the degree of competition and cooperation should be well analysed.

It was also found from the survey of port selection that geographical proximity is the most important factor of port selection, this indicates that hinterland access improvement is essential. Global container ports are also examined based on comparative analysis in order to grasp their strategies to improve container throughput market share. This analysis contains success stories of ports on developing their container throughput. The last part of this thesis contains a set of proposed strategy that could help Tanjung Perak port to improve its container throughput market share in Java region.
Acknowledgement

Above all I would like to thank Jesus Christ for His overwhelming grace and guidance in my life. Thank You for granting me the opportunity to study in Netherlands Maritime University.

It is to be underlined that this master thesis would not have been possible without the support of many people. Therefore, I would like to express my gratitude to all those who helped me to complete this thesis. First, I would like to say that I am indebted to my supervisor, Ms. Linda M.M. Treuman, for all her helpful comments and supports that she gave during the development of this thesis. I would also like to thank Mr. Cas van der Baan my second reader for his useful comments. I am very grateful to Mr. Daru Wicaksono (IPC III), Mr. Prasetyadi (TTL) and Ms. Dothy (TPS) for the fact that they were willing to share their valuable knowledge to me during the interviews. Special thanks to Elok Untari for her unstinting support through the duration of this thesis project, that I was truly motivated by her prayers. Finally, this is a great opportunity to express my deepest respect to all my colleagues in Netherland Maritime University class 13.09, it had been a fantastic year for me to enjoy the togetherness with all of class members.

Rotterdam, March 2015

Daddy Sumartono
Declarations

This thesis represents the author’s own work, except all information has been derived from other sources that it has been indicated in this thesis. The content of this thesis have not been included in a thesis, dissertation or report submitted to Netherland Maritime University or any other institutions for a degree, diploma or other qualifications. No part of this thesis can be reproduced in any form by any electronic or mechanical means (including photocopying, recording, information storage, and retrieval and any other possible means) without written permission from the author.

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Daddy Sumartono
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<th>Description</th>
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<tbody>
<tr>
<td>IPC</td>
<td>Indonesia Port Cooperation/ Pelabuhan Indonesia/ Pelindo</td>
</tr>
<tr>
<td>PT KAI</td>
<td>PT Kereta Api Indonesia, state owned railway operator</td>
</tr>
<tr>
<td>Kalog</td>
<td>Kereta Api Logistic, rail operator subsidiary of PT KAI</td>
</tr>
<tr>
<td>BJTI</td>
<td>Berlian Jasa Terminal Indonesia, terminal operator subsidiary of IPC III</td>
</tr>
<tr>
<td>TPS</td>
<td>Terminal Petikemas Surabaya, terminal operator subsidiary of IPC III</td>
</tr>
<tr>
<td>TPKS</td>
<td>Terminal Petikemas Semarang, terminal operator subsidiary of IPC III</td>
</tr>
<tr>
<td>TTL</td>
<td>Terminal Teluk Lamong, terminal operator subsidiary of IPC III</td>
</tr>
<tr>
<td>Cabang Perak</td>
<td>IPC III’s branch in Surabaya</td>
</tr>
<tr>
<td>JICT</td>
<td>Jakarta International Container Terminal</td>
</tr>
<tr>
<td>TPK Koja</td>
<td>Terminal Peti Kemas Koja</td>
</tr>
<tr>
<td>MTI</td>
<td>Multi Terminal Indonesia</td>
</tr>
<tr>
<td>APBS</td>
<td>Alur Pelayaran Barat Surabaya/ West Surabaya Shipping Channel</td>
</tr>
<tr>
<td>Pantura</td>
<td>Pantai Utara/ Road line across Jakarta, Semarang and Surabaya</td>
</tr>
<tr>
<td>ASEAN</td>
<td>Association of Southeast Asian Nations</td>
</tr>
<tr>
<td>PA</td>
<td>Port Authority</td>
</tr>
<tr>
<td>NMU</td>
<td>Netherlands Maritime University, Rotterdam</td>
</tr>
<tr>
<td>Tol Laut</td>
<td>(Sea toll) is a kind of sea conveyor belt transport that connect five major ports as its main hub, namely: Belawan, Tanjung Priok, Tanjung Perak, Makassar and Bitung</td>
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1. Introduction

1.1 Background

Ports play an important role in increasing efficiency and effectiveness of national logistic supply chains. Moreover, ports have a function as a gateway in international trade particularly between Indonesia and other countries. Therefore, the productivity of ports is the key success factor that supports the smoothness of national logistics systems, which at the bottom end will improve the competitiveness of Indonesian commodities in international markets. However, the World Bank has issued a Logistic Performance Index that places Indonesia in the 53rd rank, far below its neighbours Singapore and Malaysia which are in 5th and 25th ranking respectively (World Bank, Connecting to Compete, 2014). There are five key factors for improving logistics performance in Indonesia namely: quality of infrastructure; competence of private and public logistics service provider (logistics costs, the ability to track and trace shipments); reliability of the trading system and supply chains (timeliness); customs and other border agencies (procedures); and corruption, consistency and transparency of regulations. According to World Bank the poor infrastructure accounts for more than 40% of predicted transport costs (Limao, 1999). Infrastructure quality is a major issue for Indonesian logistics performance.

Indonesia is the world largest archipelagic country with 13.466 islands spread from Papua in the east to Sumatra in the west, sea transport becomes an important thing in order to connect among those islands. Hence, sea port in Indonesia is a key element for domestic transportation fluidity. Tanjung Perak Port is located in Surabaya that has strategic location and is the second biggest port in Indonesia. It plays a significant role in easing the national logistics system, particularly in eastern Indonesia. Figure 1 shows the patterns of domestic sea container service inbound and outbound throughout Java in 2011 (World Bank, Connectivity Report On Domestic Sea Transport, 2012). This map indicates that the majority of container distribution to eastern Indonesia region is transported through Tanjung Perak Port.
Indonesian container freight transport has experienced a strong growth over recent decades in line with the Indonesian economic growth (WTO, 2013). Private sector plays a key role in Indonesia’s solid economic performance by driving remarkable growth in investment spending on production sectors. Freight volumes and container traffic have grown because of industrialization and increasing demands from global trade as a result of Indonesia’s participation on global value chain. In Java, there are three main ports that have dedicated terminals for container handling. The biggest one is Tanjung Priok port located in Jakarta, in which most of the container terminals are owned by Indonesia Port Corporation II (IPC II). The two others are Tanjung Perak Surabaya port and Tanjung Emas Semarang port, in these ports most of the container terminals are owned by PT Pelabuhan Indonesia III (IPC III). IPC II and IPC III are state owned companies which are fully owned by the Indonesian Ministry of Stated Owned Enterprises on behalf of the Ministry of Finance.

Since the early 2009 container throughput has been rising stronger in the ports of Tanjung Priok compared to Tanjung Perak. This development is confirmed by the annual reports issued by IPC II and IPC III. According to those documents the market share of container throughput in Tanjung Perak port dropped from 35.5% in 2009 to 29.7% in 2013 (Figure 2).
Container sector is a cash cow for most ports in Indonesia, in 2013 IPC III had 47% of revenue from container handling activities,¹ and hence increasing container market share seems like the best way to boost company’s revenue. According to National Development Planning Agency, container demand in Indonesia will continue to grow along with the Indonesia’s trade growth (BAPPENAS, 2014), it indicates a great future for container ports in Indonesia. In 2012, Drewry has identified specific countries involved in the trade, determined current volumes and forecasted container growth in the Asia region through to 2017. Figure 3 shows that Indonesia’s container demand was forecasted to grow significantly each year and overlap supply (Chiang, 2013). It would be a problem for ports in Indonesia if the ports fail to expand its capacity to cope with the growing demand. But it is also an opportunity for competing ports to increase their market share through investment in capacity improvement.

¹ Gross revenue of container handling Rp 2.4 trillion from total gross revenue Rp 5.1 trillion (source: IPC III Annual Report 2013)
The decreasing of market share is surely not in line with company’s goal which is profit maximization on their business. Furthermore, the downward of market share affects the corporate image that brings a negative influence. In port, the decreasing of throughput market share affects the whole actors in port’s cluster. Therefore, it is essential to find strategies in order to regain the throughput market share. There are four main container terminals at Tanjung Perak port: PT Terminal Petikemas Surabaya (TPS), PT Berlian Jasa Terminal Indonesia (BJTI), Cabang Tanjung Perak Surabaya (Cabang Perak) and Terminal Teluk Lamong (TTL). TPS is the biggest container terminal in Surabaya and the market leader in the Tanjung Perak Port. TPS was a joint venture between IPC III, P&O Port (before P&O was taken over by DP World) and Pelindo Cooperative. BJTI is a subsidiary of IPC III with 96% ownership and Pelindo Cooperative with 4% ownership, BJTI was focused only on domestic container handling in 2002, but BJTI diversified to bulk cargo in 2012 and expand to other regions as well. Cabang Perak is one of the IPC III branches that also provides container handling services in Tanjung Perak port. Before TPS and BJTI were established, all container handling in Tanjung Perak Port was done by Cabang Perak. The IPC III horizontal integration surely affects the level of port competition in Tanjung Perak port.

In 2010, IPC III invested in a new container and dry bulk terminals in a green field area (Terminal Teluk Lamong) 10 km away from the existing terminals, but it is still under Tanjung Perak port territory. IPC III already operated its $ 299 million Teluk Lamong terminal in November 2014. The container terminal capacity only capable to handle 770,000 TEUs in first phase. There will be four phases in total with an expected capacity up to 8 million TEUs. Teluk Lamong is expected to be a new big
market player in Tanjung Perak Port. Therefore, it is substantial to increase the container throughput market share in Tanjung Perak port in order to sustain sufficient growth for the terminals expansion.

Indonesia’s Law makers has intended to remove the IPC’s legislated monopoly on commercial ports in Indonesia through Shipping Law 2008, it means that the government open up the participation of other operators in commercial port sector, including those from private sector. Under the new Law, the role of IPC, at least in principle, is limited to that of a port facilities operator and/or port services provider, operating in competition with other service providers. The impact of this new regulation is the threat from emerging new competitors in port or terminal sector that might take a chunk from decreasing IPC III’s market share. However, the Shipping Law 2008 also opens the opportunity for IPC III to expand its market and compete with other three IPCs and vice versa.

1.2 Problem statement and research questions

In reference to the background on market share of container sector in Java range, Tanjung Perak Port Surabaya has experienced a continuous downward trend compared with its main competitors. Containers throughput in Tanjung Priok Port Jakarta grows faster than containers throughput in Tanjung Perak Port Surabaya. Market share development is important to gain more economies of scale and market power. If the market share of Tanjung Perak Port in container sector is successfully increased, IPC III as a main terminal operator in Tanjung Perak port will obtain more profit from containers handling activities. Furthermore, the economy in East Java region will be successfully improved. Moreover, the huge investment in new terminal development of Teluk Lamong Surabaya has to be filled up with containers in order to obtain a fast payback time of investment. Therefore, it needs a strategic solution to overcome the downward of Tanjung Perak container throughput market share. To achieve this objective the research questions are defined as follows:

What are the key opportunities of Tanjung Perak port that can be identified to improve competitiveness of Tanjung Perak port?

What are the factors that affect port selection?

What are strategies can be suggested to increase the containers throughput in Tanjung Perak port and at the bottom end will increase the market share of containers among ports in Java range?
1.3 Methodology

1.3.1 Research approach and strategy

The assessment of this research will start with a review of the most essential developments in the global port industry and ports competition as pointed out in the scientific literature. The resources for desk research will be collected from books, journals, reports, and other literature researches. Subsequently, an analysis of containers market and ports competition in Java range will be provided. The objective of this analysis is to explore current condition of container shipping market and development of ports in Java.

This research encompasses a section in which a survey will be conducted that aims to find the factors of port choice made by the port users (shippers, cargo owners and shipping lines), the factors of port choice is used to make decisions with respect to which port would be optimal for their containers transported inbound or outbound. Comparative analysis will also to be carried out in order to reveal the possibility for improvement on ports competition. Furthermore, several other ports will be examined to see if competition indeed had an effect on the total amount of container throughput in those respective ports, as well as their strategies on increasing the throughput market share.

In order to get thorough insights into what factors that may provide opportunities or impose barriers to the ports development, interviews will be conducted with field experts in port and container terminal. Questions that will be submitted by author are those related with port competition, decreasing container throughput market share, institutional relationship and level of dependency of each firms or organizations toward container industry.

1.3.2 Data collection

To gain all necessary data for this research multiple methods will be used: both through expert interviews and desk research in which valuable data is obtained in order to explore the opportunities for the improvement of Tanjung Perak port container market share. To determine factors of port selection in Java range, a survey is conducted with port users. The surveys will be sent to the port users by emailing the web link of the questionnaire. The questions are addressed in order to answer what is the main consideration for choosing a port as the destination of their containers.

To reveal possibilities for the improvement of container throughput in Tanjung Perak port various interviews will be conducted with port expertise such as port authorities, port operators and port users. Furthermore, in order to develop a
strategy for port competition, the research focuses on comparison with other port ranges, namely Hamburg-Le havre range in Europe, ports range in Southern China, Singapore and Malaysia.

1.4 Theoretical framework

This research uses a combination of descriptive and prescriptive analysis. The descriptive section of the research takes an exploratory perspective through the analysis of port selection, inter-port and intra-port competition approaches to understand the existing literatures, the current condition and applicability to the research object, with taking into account the different characteristics from other locations. In the prescriptive section, the analysis of desk research, survey and interviews were used to identify patterns, diagnose areas of improvement and make conclusion and recommendation accordingly.

This research aims to deal with the problem statement using research orientation cycle, starts from: problem, problem definition, diagnosis, design/outcome, implementation and evaluation (Tulder, 2013). The research model in Figure 4 outlines the relationship between variables and possible deliverables for understanding.
1.5 Thesis outline

This research starts with an introduction that consists of background, problem statement and research questions, brief description of Tanjung Perak port particularly about container market, as well as the methodology, data collection, theoretical framework and thesis structure.

While chapter 2 mainly will seek to identify the key themes from the previous literature relating to port management in global transport industry, there is no scope here to go into detail about all of the issues raised before, but many specific points will be explored in further detail. This chapter will present the most essential issues of the global port and container terminal industry.

Chapter 3 will provide in depth description about the existing market condition of container transport in Java that comprises of: analysis of ASEAN container market,
description of existing terminals and ports, as well as port’s hinterland characteristic. The port’s structure based on Shipping Law No.17/2008 will be provided in order to give a better understanding of the unique characteristic of ports in Indonesia.

Chapter 4 mainly will provide an analysis about five forces that shape the competitive landscape of Tanjung Perak Port, as well as analysis of intra-port in Tanjung Perak port and inter-port competition in Java range. This chapter will use diagnostic approaches in order to reveal the potentials as well as challenges of Tanjung Perak port.

In order to reveal the criteria that port users consider to choose which port is used to transport their containers for inbound and outbound Java, chapter 5 will describe an analysis about port selection. Questionnaires are provided in order to get empirical data. This chapter also describes the findings from interviews about the major reasons for the decrease of Tanjung Perak port’s container throughput market share.

Next, the strategies for improving Tanjung Perak port’s container throughput market share will be proposed in chapter 6. This chapter will start by analysing the various port’s strategies, which is successfully implemented in order to gain more container throughput market share. Subsequently, the alternative solutions obtained from literature review which is adaptable for Tanjung Perak port will be provided. Finally, this chapter will propose the best strategic possibility for Tanjung Perak port and IPC III towards its container terminals in order to gain more container throughput market share. The author would like to recommend the best alternative solution in order to increase the market share of containers, and how they could implement the solution in order to be able to give benefit for all stakeholders in port region especially for IPC III.

Finally, chapter 7 will encompass the summary of the discussions, analysis and findings of this research. This chapter also will provide a recommendation for the direction of future research.
2. Literature review

This chapter presents the results of a desk research from literatures in the field of port management and related subjects. The main purposes of the literature review are to look at some major issues in port management literature and to present framework for classification and analysis. Furthermore, literature review helps to prescribe possible solutions for the research problems.

This chapter will be organised in five sections. In section one the market share of port is going to be discussed. Section two will explain the structure of a marine logistics chain and criteria of port selection. Section three will contain five forces that shape competition. Section four is going to discuss about port competition that contains intra-port and inter-port competition. Section five will explain about relationship of ports. Finally, a conclusion will be drawn from the work.

2.1 Market share of ports

The business firms established with their own organizational objectives. Most of the firms have focused on continuation of business, maintaining market leadership, displacing the current leader in the industry, or chasing down the current leader market share. The advantage of being market leader is the ability to exploit economies of scale and market power. In addition, the market leader also has reputational advantages. The objective of this research is to explore and propose recommendations regarding the container throughput market share of Tanjung Perak Port in container sector that can be improved. Improving the market share is not only just capturing new markets which have never been penetrated by the rival. Walter J. Ferrier argued that a new competitive action might include the introduction of a new promotional campaign that disrupts a market by stealing market share from a rival (Walter J. Ferrier, 1999). From this argument, we can apply that market share improvement can be done by capturing the rival’s market share.

Seaports have unique economic characteristics (economies of scale, scope and capital density) which tend to make them natural monopolies. However, a port can also deal with fierce competition from other ports in their port range. Each port has their own hinterland to serve, this hinterland area determine the market share of ports among the ports range. The word ‘range’ refers to a geographically defined area encompassing a number of ports with a largely overlapping hinterland and thus serving much the same customers (Huybrechts, 2002). These ports are
regarded as potential competitors of one another, they evolve in time and space that makes port competition become fiercer.

The hinterland can be differentiated between captive and contestable hinterlands. All regions where one port has a substantial competitive advantage because of lower generalized transport costs to these regions belong to the captive hinterland of this port. Consequently, this port handles the vast majority of all cargoes to/from these regions. Contestable hinterlands consist of all those regions where there is no single port with a clear cost advantage over competing ports (Langen P. d., Port competition and selection in contestable hinterlands; the case of Austria, 2007). So, the possible ways to gain the port market share are converting the contestable hinterland to become captive hinterland or expanding the contestable hinterland into rival’s captive hinterland.

2.2 Structure of a marine logistics chain and factors of port selection

The success of the port in a region depends on the decision makers of port selection which are freight forwarders, shippers and shipping lines as port user, they can switch from one port to another port in a region for their own benefit. Therefore, the relationships between ports and port users need to be described. Seaports, as an integral part of the maritime supply chain are made up of various links. These are often managed and operated by different actors, but may also display a degree of integration. Hence any aggregate-level decision within the port structure triggers a chain reaction (Hilde Meersman, 2010). This research looks at the decision making of port users that determine a port selection in Java range.

The structure of maritime logistic chains depends on three important components: the maritime connections, the cargo-handling operations, and the distribution towards the hinterland. Figure 5 shows a basic overview of such a logistics chain. This structure depends on the type of cargoes and the type of chain management, it may become more complicated and more parties involved.
In order to understand the factors that determine the degree of competitiveness in a port range, analysis of ports selection needs to be tackled. There is a growing literature on port selection, every literature has their own factors that determine port selection. It is reasonable because they choose different hinterland and respondent for the survey or interview. However, according to the literature the most important factor in port choice is the location (distance of the origin or destination in the hinterland area) that determines the total cost of shipment. Second, good characteristics (such as value density and refrigerated or not) influence port choice. Third, the flexibility of shipment schedule is also important, the number of ship calls and routes offered by port is really affect the port choice (Langen P. W., 2007).

2.3 Five forces that shape competition

Michael Porter argued that understanding the competitive forces and their elemental causes, reveals the foundation of an industry’s current profitability while
providing a framework for anticipating and influencing competition over time (Porter, 2008). Porter’s five forces that shape industry competition are namely: First is the threat of new entrants, a new entrant in port industry brings new capacity for the market that puts pressure on price and cost. Second is the power of suppliers, integration of global logistic supply chain has increased the bargaining power of shipping lines. Third is the power of customers, port users have their own criteria on port selection, they can shift the cargo flows from one port to another which fit with their interests. Fourth is the threat of substitute service, there is no fierce competition from the substitute services of port, each transport mode has their own segments that mainly are not in position to compete each other. Sea transportation is cheaper in some extents and more environmental friendly compare with another transport mode. Fifth, the rivalry among existing competitors, two ports with similar characteristic that are close together in the same range, are in strong competition even if they connect different value chain or if they serve different customers. The source of competition of a port not only comes from rival port in the same region, but also comes from other regions that needs to be considered.

**Figure 6: Porter’s Five Forces That Shape Industry Competition**

2.4 Port competition

Over the past two centuries, maritime transportation sector has radically changed. Ports have profoundly transformed from instruments of state and colonial power to become global distribution hubs. Most of the ports today are competing each other
to improve port efficiency, lower cargo handling cost and integration in supply chain (World Bank, 2007).

From the scientific literature, Port competition can be distinguished by inter- or intra-port competition, the difference is on the level of competition. The former is competition among ports and the latter is competition within port. Inter-port competition is competition among different ports (ports level), whereas Intra-port competition is competition among marine terminals within the same port (Talley, 2009). Port competition is usually considered as competition among ports in a region or competition among terminals in a port. Van de Voorde & Winkelmans consider three levels of port competition. The first one is competition within operators in a port with regard to a specific service, or called intra-port competition. The second one is the inter-port competition at operator level, meaning competition among operators from different ports within the same range. The last one is inter-port competition at port authority level, which is competition within ports in a region. The three levels of port competition are illustrated in Figure 7 (Van de Voorde, 2002).

In addition to the three levels mentioned above, in fact there is another level that should be added as the fourth level. Within the globalization of economy, terminal
operators tighten their grip on the maritime logistics chain and build up extensive networks. As a result, some terminal operators integrate horizontally with other terminal operator from different ports. Hence, competition among networks of terminal operators can be added as the fourth level.

Ports have unique characteristics (economies of scale, scope and density, and lumpy investment) that make terminal operators in a port constitute natural monopolies for port users located in the captive hinterland. A port located in captive hinterland has a great competitive advantage, because of shorter geographical proximity and lower generalised transport cost. Port users are forced to pay ‘monopoly price’ because they cannot shift to an alternative port within port region without facing substantial additional costs. A terminal operator that holding monopolistic power can exploit the elasticity of demand of port users, resulting in ‘abnormal’ pricing and strict operational conditions. Therefore, intra-port competition can be introduced in order to prevent monopolistic ports service provider. However, intra-port competition is only relevant if inter-port competition within the port range is not fierce enough or imperfect (Goss, 1999), because intra-port competition prevents dominant market player in a port range. Without the existence of dominant market player of terminal operator in a port results in more competitive service costs that makes the port is attractive for the port users.

Intra-port competition can be impossible to be introduced in a port, the measure for feasibility of intra-port competition is that the market should be at least twice as large as the Minimum Efficient Scale (MES) for providing a port service (Langen P. W., 2009). MES is the lowest scale necessary to achieve the economies of scale required to operate efficiently and competitively in an industry. In ports, the MES is often compared to the market size, the MES affects the number of terminals that can operate in a market. When MES is low, relative to the size of the market, various terminals can operate efficiently.

The benefit of intra-port competition as provided are: the first and most widely acknowledged argument for intra-port competition: it prevents (monopolistic) market power of port service providers. The second argument for the benefits of intra-port competition leads to specialization, flexible adaptation and innovation (Langen P. W., 2009). In a fierce market environment that has the same user base, the same trade cost and the same regulation, the market players tend to specialize their services. This specialization increases the performance of the cluster, because the products and services become specific in order to meet customer’s needs. The competition among terminal operators within a port triggers entrepreneurship and
creativity. This condition forces the terminal operators to make innovation in their services and become more efficient. This dynamic process keeps ports competitive.

2.5 Relationships of ports

Ports within a region surely have geographical proximity among each other. They also communicate and keep an eye on each other in order to gain knowledge and learn. This allows them to innovate continuously, so that is why the proximity is important. From the literature, there are five dimensions of proximity (Boschma, 2005):

- Cognitive proximity: the knowledge gap between actors
- Organizational proximity: the way in which control is exercised between actors through command or contractual means
- Social proximity: The relationship under trust based between actors
- Institutional proximity: the rules, regulations, norms that govern relationship between actors
- Geographical proximity: the spatial or physical distance between actors

Boschma argues that all forms of proximity must be appropriately balanced to support innovation. Otherwise, if the proximity is too much or too little, it can hamper the innovation. For instance: too much cognitive proximity lead to a lack of creativity, but too little cognitive proximity will result in a lack of understanding; too much organizational distance can lead to bureaucracy, but too little organizational distance means that lack of control and increase the danger of opportunism; and so on.

Typology of ‘port in proximity’ reflects two dualisms as described in Table 1, namely (1) the spatial dimension of inter- versus intra-port proximity, and (2) the multidimensional notion of high versus low proximity. The typology pinpoint four results possibility of ports (Peter V. Hall, 2009). In conclusion, ports should be aware on keeping the level of intra- and inter-port competition appropriately balanced not too low or not too high, otherwise it will hamper the innovation toward ports.
Table 1: Typology of ports in proximity and proximity in ports

<table>
<thead>
<tr>
<th>Intra-port proximity</th>
<th>Inter-port proximity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Low: Type 1: Many disparate actors lacking common purpose, without mission clarity and coherence</td>
</tr>
<tr>
<td>High</td>
<td>High: Type 2: Dominating player(s) have potential for spatial monopoly, lock-out</td>
</tr>
</tbody>
</table>

Source: Peter V. Hall and Woulter Jacobs, 2009

Type 1: this type of port is lack of sufficient coordination internally and externally. This port has problems on infrastructure upgrading and business development because of the lack of knowledge. This was happening in Tanjung Perak port in early 90’s that the central government took control over the container terminals, and did not interact well with the local government and the private operators.

Type 2: this means the port will run the risk of becoming locked into a single or small number of dominant players. The dominant players as they are close organizational and social proximity will enjoy monopolistic environment.

Type 3: this type of port has a high risk of exploitation from the key players, because of the lack of internal coherence. The key players have high bargaining position that enables them to threaten to move next door to extract concession.

Type 4: this is the worst scenario of ports in the era of globalisation, because there is a risk of destructive competition. The market players have potential to tighten their grip on the maritime logistics chain and build up extensive networks.

The relationship between two ports within a maritime region is determined initially by the ‘profile’ of the ports. Ports in proximity can either be in a position of competition or on the contrary in a position of cooperation or complementarity.

Two ports within a maritime range with the same type of cargoes are naturally in strong competition even if they connect different value chain or if they serve different customers (Figure 8.a). Two ports with different profiles can develop new flows in the secondary port, it will enable to maintain its control or even develop new transport chains which are beneficial to its entire port region. The benefit of developing co-operation between them is that both of them become more specialized in order to make space available for expanding flows in mega-port
Further, two ports within a maritime range with the same type of cargoes may wish to develop a complementary relationship (coopetition) involving flows of the same type. This will provide the benefit of increasing the diversity of traffic through secondary port (Figure 8.c) (Antoine, 2009).

Figure 8 : Typology of ports and inter-port relationships

2.6 Conclusion

Market share improvement can be done by capturing the rival’s market share. The market share of port comes from the hinterland around maritime range, so the port can either convert the contestable hinterland to become captive hinterland or expand the contestable hinterland into rival’s captive hinterland in order to improve the market share of port. To be able to do that, the port must consider the factors of port choice that are determined by ports user in maritime logistic chain. From the literature review we know the factors of port choice which are: location, characteristics and flexibility. In order to attract more port users, the port as well as terminal operators must meet the customer needs by providing competitive services.

Intra-port competition is appropriate to enhance innovation and specialization that make the terminal operator become competitive. However, intra-port competition is feasible to be implemented if there is no fierce inter-port competition. Therefore, in order to reveal the degree of port competition as well as to find the proper strategy to obtain more market share, the analysis of port competition needs to be conducted.

Ports within a region that have geographical proximity could either in be a position of competition or on the contrary in a position of cooperation or complementarity. The relationship of these ports as well as terminals should be appropriately
balanced not too low or not too high in multi-dimensional of proximity, otherwise it will hamper the innovation toward ports.

Above mentioned conclusion is solely based on the scientific literature. Therefore, in the following chapters, all of the theories in this chapter will be applied towards ports in Java.
3. Analysis of container market

In order to understand the trends and development of container ports in Java, it is essential to analyse the container market. First, the analysis of container market in ASEAN will be discussed. Second, container transport in Java will be explained that consist of all transport mode for containers. Third, ports and terminals in Java will be shown in order to get the characteristics of the ports and terminals. Finally, the port governance after the Shipping Law 2008 will be discussed.

3.1 Container market in ASEAN

Association of Southeast Asian Nations (ASEAN) is an economic community in southeast Asia region that consist of Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand and Viet Nam. ASEAN is an example of a success in gaining benefit on global supply chain by opening up for offshoring of labour-intensive manufacturing stages. In order to increase trade among ASEAN countries and enhance ASEAN’s competitive advantage as a production base, the ASEAN Free Trade Area (AFTA) was signed on 28th January 1992. AFTA has opened up ASEAN economies and has been integrated with world economies by removing their trade barrier. In 2013, the total value of intra-ASEAN trade reached $ 608 billion is a one-third compared with extra-ASEAN trade $ 1.902 billion (ASEAN, 2014).

3.1.1 Container ports development

ASEAN has developed into one of the most active container port regions in the world, 6 of ASEAN ports in the list of top 25 world’s container ports (World Shipping Council, 2014). Port of Singapore Authority has always been leading on container traffic in Southeast Asia region by exploiting its geographical location. Singapore is well known as a hub port for containers, most of Asia-Europe services call Singapore as a part of transhipment port, one call to Singapore will cover any other ports in the region. Singapore has a good infrastructure that allows big ships with big draught to access the port, while most ports in the region still struggle on limitation of draught, therefore transhipment through smaller ships is the only choice for small feeder ports.

Developing countries in Southeast Asia also known as the emerging markets are the best place to put investment. Their growing economy attracts foreign and domestic investment. Countries like Malaysia and Indonesia are undertaking serious
actions to capture more container throughput and reduce transhipment cost in Singapore by investing in their ports. Tanjung Pelepas Port (TPP) in Malaysia was officially opened in 2000 and has succeed in capturing some of Maersk Sealand and Evergreen containers from Singapore. The role of private sector to invest in developing and operating container terminals is the key success of TPP. Meanwhile in Indonesia, the construction of Kalibaru terminal in Tanjung Priok Port is still in progress, this project is expected to reduce transhipment of containers. Figure 9 shows the container throughput of ports in Southeast Asia. Singapore container throughput during financial crisis in 2009 dropped significantly, however since 2010 the throughput has continued to rise and dominate the market.

**Figure 9: Container throughput in Southeast Asia (in million TEU)**

![Chart showing container throughput in Southeast Asia](chart)

Source: AAPA World Port Rankings, various years

### 3.1.2 Trends and development of container shipping

The shipping industries have been suffering loss since global financial crisis happened in 2009. New vessels that are ordered during the high freight rate have to deal with overcapacity, forcing operators to reduce the freight rate to the bottom. The operators have to find ways to fill up their ship with cargoes and become more efficient. Shipping alliance very popular on shipping industries, are for instance: Ocean Three Alliance (consist of CMA CGM, China Shipping and Middle East Shipping) and 2M Alliance (consist of Maersk and MSC). The alliances surely aim to push smaller competitors out of the market especially for Asia-Europe route
because these alliances have bigger ships which are more efficient in fuel consumption that the smaller ships will not able to compete. As the smaller competitor as well as less efficient ships out of the market, it will reduce the oversupply to normal level.

Table 2: Order book of container ships

<table>
<thead>
<tr>
<th>Capacity range</th>
<th>Existing Fleet 31 December 2013</th>
<th>On Order Until 2017</th>
<th>Capacity growth until 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 13,300 TEU</td>
<td>66</td>
<td>101</td>
<td>165%</td>
</tr>
<tr>
<td>10,000-13,299 TEU</td>
<td>130</td>
<td>52</td>
<td>36%</td>
</tr>
<tr>
<td>7,500-9,999 TEU</td>
<td>375</td>
<td>142</td>
<td>39%</td>
</tr>
<tr>
<td>5,100-7,499 TEU</td>
<td>489</td>
<td>35</td>
<td>7%</td>
</tr>
<tr>
<td>4,000-5,099 TEU</td>
<td>763</td>
<td>37</td>
<td>5%</td>
</tr>
<tr>
<td>3,000-3,999 TEU</td>
<td>261</td>
<td>34</td>
<td>14%</td>
</tr>
<tr>
<td>2,000-2,999 TEU</td>
<td>665</td>
<td>53</td>
<td>7%</td>
</tr>
<tr>
<td>1,500-1,999 TEU</td>
<td>565</td>
<td>46</td>
<td>8%</td>
</tr>
<tr>
<td>&lt; 1,500 TEU</td>
<td>1,662</td>
<td>33</td>
<td>2%</td>
</tr>
</tbody>
</table>

Source: Alphaliner, 2014

In spite of the oversupply, from Table 2 we can see the continuous growth of container ships. The new orders are dominated by big ships above 7,500 TEU because they are more efficient, it is important to keep efficient especially in low freight rate period. Container ship above 13,300 TEU was forecasted to grow in total capacity to 165%, meanwhile the small ships under 7,500 TEU have very little growth. The bigger ships will replace the smaller ships to serve in the same routes, and for shipping industry will require the scrapping of small ships.

It is challenging for ports and terminal operators to cope with this trend. To be able to handle a big ship in a port needs a huge amount of investment up front, the infrastructure and equipment surely need to be upgraded. Many ports in Southeast Asia have limitation on access channel draught and terminal capacity, these ports cannot compete to become transhipment hub and would only be feeder ports. Tanjung Perak port also concerns with this problem, some investment has been made to improve infrastructure quality in order to remain in the market.
3.2 Containers transport in Java

As GDP growth in Indonesia continues to expand, the demand for transporting cargo is growing in every year. However, the increasing demand of transporting goods is not offset by the development of transportation infrastructure. Most of containers in Java are transported by trucks, the density of container truck in Java reaches 30,000 unit that leads to road congestion, air pollution, road damage and growing of fuel subsidy (Aradyah Eko, 2013). The Head of Indonesian Institute of Science (LIPI) said based on statistical data, that logistic cost in Indonesia is the highest among other Southeast Asian countries about 25% - 30% of GDP (Industri.Bisnis.com, 2012).

3.2.1 Road transport

Road transport is the main transportation in Java, according to Indonesian Logistic Association (ALI) about 95% of logistic in Java is transported by truck (ALI, 2014). Road transport allows the user to get door-to-door services without additional cargo handling cost, flexibility on delivery schedule also gives advantage. Trucking is relatively cheap because of fuel subsidy by the government, in 2014 the government budget for fuel subsidy was Rp 246 trillion a year (The Jakarta Globe, 2014). Jakarta-Semarang-Surabaya is connected by north coast lane (Pantura) as far as 727 km. Pantura is congested by trucks, private cars and public vehicles, it takes about 3 days for truck to travel from Jakarta to Surabaya. Freight rate of trucking from Jakarta to Semarang is about Rp 7.3 million and from Jakarta to Surabaya Rp 10 million (Aradyah Eko, 2013).

3.2.2 Rail transport

Rail transport is an alternative for container transport. Its competitive price and on time delivery are the main attractiveness. Tariff for transporting a container from Jakarta to Surabaya is about Rp 2.5 million (include lift on/lift off). The travel time is faster than truck, it takes only 16.5 hour to deliver containers from Jakarta to Surabaya by rail. However, transporting a container from port to destination still needs trucks to transport the container to or from rail station, also it needs times to mount to the locomotive. Railway transport sector recently has recorded a big investment. The government succeed in developing double track railway to connect Jakarta-Semarang-Surabaya on May 2014, the construction allows trains to simultaneously travel in both directions. Concerning freight traffic, the volume is expected to rise to 15,000 TEUs per week from 5,000 TEUs before (Kalog, 2014). This double track or parallel track could either be a threat or an opportunity for port of Tanjung Perak, because of the improved transport infrastructure which can be
used for diverting the container flow from hinterland in Java either to Tanjung Priok, Tanjung Emas or Tanjung Perak.

3.2.3 Sea transport

There is no liner service that is dedicated only to serve Jakarta-Surabaya route. But, there are international routes that cover Surabaya-Jakarta-overseas, and also domestic routes that cover Jakarta-Surabaya-Bitung served by local shipping line PT Meratus and PT SPIL. Tariff for transporting a container through shipping line from Surabaya to Jakarta is about Rp 4.2 million/TEU, that consists of Rp 3 million as freight rate and Rp 0.6 million as container handling charge in each port, because the container is loaded at Tanjung Perak port and then discharged at Tanjung Priok port. The tariff is quite competitive compared with trucking, but the low productivity in ports often causes delays. Tanjung Perak port and Tanjung Priok port have approximately 1.5 days of waiting delays in each port (Ardyah Eko, 2013).

In 2013, the IPCs and Ministry of Transport tried to develop a sea transport concept for domestic sea transport system that was intended to reduce sea freight costs and waiting time. This sea transport system is called Pendulum Nusantara. The President Director of IPC II, R.J. Lino believed that Pendulum Nusantara can create an efficient and integrated goods distribution system that reduce sea transport costs by 50%. Pendulum Nusantara is a kind of sea conveyor belt transport that connect six major ports as its main hub, namely: Belawan, Batam, Tanjung Priok, Tanjung Perak, Makassar and Sorong. Those hub ports will be connected with vessels that have minimum capacity of 3,000 TEUs to get benefit from the economies of scale. However, in January 2015 the government finally has launched the President Decree number 2 year 2015 about National Medium Term Development Plan 2015-2019 (RPJMN) that introduce the Tol Laut (sea toll) concept which is slightly different from Pendulum Nusantara. The difference is on the selection of hub ports that consist of five ports namely Belawan, Tanjung Priok, Tanjung Perak, Makassar and Bitung.
This national transport plan certainly will change the logistics networks in Indonesia which implement Tol Laut as a back bone of domestic shipping transport. However, there is still a doubt for Tol Laut to be successfully implemented. An argument said that it is difficult to make vessels that serve Tol Laut have fully loaded with goods in order to achieve the economies of scale, especially in the Eastern part of Indonesia which is less developed than Western part of Indonesia.

The domination of road transport is predicted to decrease as the new elected Indonesian President has a plan to gradually cut fuel subsidy and allocate the budget for infrastructure, health and education investment (Taylor, 2014). In 18 November 2014, the fuel price was already increased from $0.45/litre to $0.61/litre due to the reduction of fuel subsidy. With less fuel subsidy given it will make the trucking rates become more expensive, then the rail transport and sea transport will be more competitive.

### 3.3 Ports and terminals in Java

A container port is the place, where non-transhipment containers received from vessels are transferred to inland carriers such as railroads, truck carriers, and inland waterway and coastal (i.e., short sea) carriers, and vice versa, and transhipment containers are transferred from one vessel to another (Talley, 2009). Container ports in Java have been struggling to expand its capacity to anticipate
the increasing container throughput. All of container ports in Java have similar characteristics which are located in the shore land of big cities, those ports have the same problems of congestion and land scarcity. Figure 11 shows three major container ports in Java Island namely: Tanjung Perak port, Tanjung Priok port and Tanjung Emas port.

Figure 11: Major container ports in Java Island

3.3.1 Tanjung Perak Port
Tanjung Perak Port is the main port of East Java province, the second busiest port in Indonesia and as a hub port for feeder ports in Eastern of Indonesia. This port has unique location that located inside of Madura Strait. The advantage of being inside the strait is protection from strong winds and tidal waves that can be harmful for ship operation, therefore there is no need for expensive investment in sea wall construction that protects from tidal waves. However, Strait Madura is a typical of high sedimentation strait that becomes a natural barrier for Tanjung Perak port, it needs regular dredging to maintain the depth and the width of the channel. A part of Strait Madura that is used as access channel of Tanjung Perak Port is called West Surabaya Shipping Channel (APBS). Now, the APBS is being dredged to deepen the channel from -9.5 meters to -13 meters Low Water Spring (LWS) and expand from 100 meters to 150 meters width, the first phase project will be finished in 2015. In the second phase, the APBS will have -16 LWS depth and 200 meters width (Jamrud, 2014). Tanjung Perak Port only has one main entrance from north side of Strait Madura, while in the south side it can only be accessed by small ship because of 30 meters air draft restriction from Surabaya-Madura bridge. The APBS investment was initiated by IPC III, therefore the Ministry of Transport gives IPC III a ‘right to match’ to procure the dredging company and fund the project as well. In addition to the draft barrier, there is an undersea gas pipeline that formerly belonged to Korean company Kodeco. This pipeline across the APBS access channel and surely endangered shipping activities in port. Therefore, the state owned oil company Pertamina which now owns the gas pipe was forced to relocate the pipeline (Indra, 2013). Figure 12 shows the Tanjung Perak port access channel.
The main hinterland of Tanjung Perak Port is in East Java region, most of the containers have origin or destination in Gresik, Bangkalan, Mojokerto, Surabaya, Sidoarjo and Lamongan (Gerbangkertasusila) due to population density and large industrial areas in the region. As an archipelagic country Indonesia needs a hub sea port to transport cargoes to any island in Indonesia especially in Eastern Indonesia, therefore Tanjung Perak holds the potential as a hub sea port of Indonesia because this port has strategic geographical location, which is in the centre of Indonesian archipelago.
Tanjung Perak Port has four container terminals that are owned by IPC III: (A) Terminal Petikemas Surabaya (TPS); (B) Berlian Jasa Terminal Indonesia (BJTI); (C) Cabang Tanjung Perak (Cabang Perak); and (D) Terminal Teluk Lamong (TTL).

**TPS**

TPS is joint venture Company within IPC III, DP World and Pelindo Cooperative. This terminal is dedicated only in container handling. TPS is the busiest container terminal in Tanjung Perak Port, the container throughput rose to 1.6 million TEU in 2013. The advantage of TPS geographical location is that it is located in the area that is directly connected with the highway and railway. TPS has invested on Terminal Operation System that allows the customers to monitor the real time movement of container, furthermore it is possible to interchange the electronic data within TPS, customers and customs.

**BJTI**

BJTI is a subsidiary of IPC III with 96% of share over BJTI. This company is not only able to handle containers but also bulk cargo, liquid cargo and general cargo as well. BJTI is located inside Tanjung Perak Port sea basin with maximum draught only -9.6 meters, this terminal is still using Harbour Mobile Cranes to load and discharge containers. Mostly it handles domestic containers from small ships due to draught limitation. In 2013, the container throughput reached 885,954 TEU for domestic container and 33,051 TEU for international container. BJTI is the most productive terminal in Tanjung Perak port, because the high amount of container throughput with just 5.5 acre of yard. BJTI successfully achieves the high level of throughput because of “truck losing” strategy, in which every container is discharged from a ship to a truck that directly moves to the container outside the terminal without stacking inside the terminal.

**Cabang Tanjung Perak**

Cabang Tanjung Perak operates three terminals namely: Jamrud terminal, Nilam terminal and Mirah terminal. Cabang Tanjung Perak is known as a conventional container terminal operator, which means Cabang Tanjung Perak terminal is not dedicated area for containers, but it is mixed with general cargo or bulk. Furthermore, the operational processes still need a lot of labour and uses less efficient equipment such as Harbor Mobile Crane and forklift in the yard, but only Nilam terminal that has container cranes. The productivity of container handling is relatively low, only 9 to 11 Box/Crane/Hour in Mirah and Jamrud terminal, this terminal mainly handles domestic containers from container ship, general cargo ships and Ro-Ro.
TTL

TTL is built to reduce congestion in Tanjung Perak port and to anticipate throughput growth. The container terminals in Tanjung Perak Port was nearly in full utilisation and became less efficient because the capacity of yard and equipment were already in maximum level and congestion of vessels and trucks in terminal area.

Therefore, the construction of new terminals was required. TTL is the only terminal in Indonesia yet that has green concept, in which all of the equipment and trucks inside terminal area are powered by electricity or gas, TTL is also the first container terminal in the country that uses Automated Stacking Crane. This green concept doesn’t seem pretty attractive for local shipping lines and shippers at the moment, but it may be an advantage to attract international shipping lines that concern more about environment sustainability. TTL is located 10 km away from Port of Tanjung Perak old terminals in order to decongest truck traffic in the port, it will be directly connected by the highway. The TTL was firstly operated on 12 November 2014, this first phase project is capable of handling up to 5,000 TEU container ships.

Figure 14: First operation of Terminal Teluk Lamong on 12 November 2014
Table 3: Facility and productivity of container terminal in Tanjung Perak Port year 2013

<table>
<thead>
<tr>
<th></th>
<th>TPS</th>
<th>BJTI</th>
<th>Cabang Perak</th>
<th>TTL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment</td>
<td>Ship To Shore Crane (11 unit)</td>
<td>Harbor Mobile Crane (14 unit)</td>
<td>- Container Crane - Harbor Mobile Crane</td>
<td>- Ship To Shore Crane (5 unit) - Automated Stacking Crane (10 unit)</td>
</tr>
<tr>
<td>Berth length (meter)</td>
<td>1.450</td>
<td>1.380</td>
<td>800</td>
<td>950</td>
</tr>
<tr>
<td>Yard (Ha)</td>
<td>27.5</td>
<td>5.5</td>
<td>3</td>
<td>15.8</td>
</tr>
<tr>
<td>Draft alongside (meter)</td>
<td>-7.5 to -10.5 LWS</td>
<td>-6.5 to -9.6 LWS</td>
<td>-6.5 to -9.6 LWS</td>
<td>-14 LWS</td>
</tr>
<tr>
<td>Crane rate (box/crane/hour)</td>
<td>28</td>
<td>26</td>
<td>Jamrud: 9 Nilam: 22 Mirah: 11</td>
<td>30 to 35</td>
</tr>
<tr>
<td>Crane rate per vessel (box/ship/hour)</td>
<td>36</td>
<td>-</td>
<td>-</td>
<td>n/a</td>
</tr>
<tr>
<td>Berth Occupancy Ratio (%)</td>
<td>67</td>
<td>80</td>
<td>Jamrud: 69 Nilam: 71 Mirah: 84</td>
<td>n/a</td>
</tr>
<tr>
<td>Yard Occupancy Ratio (%)</td>
<td>55</td>
<td>-</td>
<td>Jamrud: 37 Nilam: 44 Mirah: 12</td>
<td>n/a</td>
</tr>
</tbody>
</table>

Source: IPC III annual report 2013 and official website from various terminals

Table 3 indicates the high rate of Berth Occupancy Ratio (BOR) in TPS and BJTI, according to UNCTAD the high level BOR (above 70%) is sign of congestion while low level BOR (under 50%) is sign of underutilise (UNCTAD, 2012). BOR level is expected to be reduced in 2015 as TTL starts its operation in this year, hence Tanjung Perak Port is ready to take more container traffic in the following years.

3.3.2 Tanjung Priok Port

Tanjung Priok Port is the busiest port in Indonesia that is located about 10 km of north-east of Jakarta city centre and the only international commercial port in Jakarta. Tanjung Priok Port plays an important role for sea cargo transportation and sea passenger transportation as well. In all the frontage area, the port is surrounded by the residence of Jakarta, which is one of the fast growing population city in Java because of the high rate of urbanisation. This growth has provided challenges for the city dealing with issues of land scarcity and congestion also restrict Tanjung Priok port for further expansion. Tanjung Priok Port has direct access to Java Sea, so it needs sea wall to protect it from sea waves. Tanjung Priok Port has six wharves and two harbour entrances: Eastside and Westside. However, only Westside harbour entrance is available with -14 meters of depth. The width of
sea lane is so narrow that basically it is one way. Due to such circumstance it is generally inconvenient for ships to manoeuvre.

Container traffic growth in Tanjung Priok port is remarkable, in 2009 container throughput was just 3.8 million TEU. Within four years it almost doubled to 6.5 million TEU in 2013. Most of the containers have destination or origin in Jakarta, Bogor, Depok, Tangerang and Bekasi (Jabodetabek) which is industrial power house of West Java and area with population density.

**Figure 15: Layout of Tanjung Priok Port**

Tanjung Priok port has 3 main container terminals: Jakarta International Container Terminal (JICT), Terminal Peti Kemas Koja (TPK Koja) and Multi Terminal Indonesia (MTI) owned by IPC II. JICT started to operate its first container terminal in 1978, which is now known as JICT II. Expansion of the new container terminal JICT I was opened in 1990. The main shareholder of this company is Hutchison Port Holdings with 51% of share and the rest 49% owned by IPC II. JICT is the largest container terminal in Indonesia, it covers total of 100 hectares in Tanjung Priok Port. In 2013, JICT achieved the highest annual container throughput reaching up to 2.4 million TEU. While TPK Koja was opened in 1998, the main shareholder of this company is IPC II with 51% of share and the rest 49% owned by Hutchison Port Holdings.
Table 4: Facility and productivity of container terminal in Tanjung Priok Port

<table>
<thead>
<tr>
<th></th>
<th>JICT I</th>
<th>JICT II</th>
<th>Total</th>
<th>KOJA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quay Crane</td>
<td>16</td>
<td>3</td>
<td>19</td>
<td>6</td>
</tr>
<tr>
<td>RTG</td>
<td>63</td>
<td>11</td>
<td>74</td>
<td>21</td>
</tr>
<tr>
<td>Berth length</td>
<td>1,640 m</td>
<td>510 m</td>
<td>2,150 m</td>
<td>620 m</td>
</tr>
<tr>
<td>Draft alongside</td>
<td>-11 to -14 m</td>
<td>-8.6 m</td>
<td>-</td>
<td>-14 m</td>
</tr>
<tr>
<td>Terminal Area</td>
<td>45.5 ha</td>
<td>9.2 ha</td>
<td>54.7 ha</td>
<td>21.8 ha</td>
</tr>
<tr>
<td>Stacking capacity</td>
<td>39,884 TEU</td>
<td>7,056 TEU</td>
<td>46,940 TEU</td>
<td>14,256 TEU</td>
</tr>
<tr>
<td>Quay Crane rates (box/crane/hour)</td>
<td>-</td>
<td>-</td>
<td>27</td>
<td>25</td>
</tr>
<tr>
<td>Cranes per vessel (unit)</td>
<td>-</td>
<td>-</td>
<td>2.2</td>
<td>2.0</td>
</tr>
<tr>
<td>Vessel working rate (moves/vessel/hour)</td>
<td>-</td>
<td>-</td>
<td>60</td>
<td>50</td>
</tr>
<tr>
<td>Berth handling rate (moves/hour)</td>
<td>-</td>
<td>-</td>
<td>48</td>
<td>n/a</td>
</tr>
<tr>
<td>BOR</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>63 %</td>
</tr>
</tbody>
</table>
| YOR                 | -      | -       | -     | Import = 77%  
|                     |        |         |       | Export = 47% |

Source: IPC II (2013)

Tanjung Priok Port has experienced rapid growth of container throughput in last few years, it will continue to grow as substantial economic growth in the country. However, the long dwelling time at Tanjung Priok is one of the largest concern, according to World Bank the average import container dwell time increased from 4.8 days in 2010 to 6.4 days in 2013 (World Bank, 2014). In short and long term view, the additional container terminals are highly required in vicinity of Jakarta. Therefore the development of Kalibaru terminal was started in 2012 and expected to start its operation for the first phase project in 2018. IPC II has invested $ 2.47 billion in the first phase of the Kalibaru terminal which consists of a container terminal with a capacity up to 4.5 million TEUs and a liquid bulk terminal with a capacity up to 9.4 million m³ (Nadya, 2014). The first phase container terminal will be operated by Mitsui & Co.Ltd as preferred bidder.
Ernst & Young Shin Nihon, Japan External Trade Organization, ITOCHU Corporation and Oriental Consultant have conducted a study on Jakarta international gateway port development project in Indonesia that was prepared for Ministry of Economy, Trade and Industry. The study concluded some issues about Tanjung Priok Port as mentioned below (Ernst & Young, JETRO, ITOCHU and Oriental Consultant, 2011):

- **Shortage of port facilities**

  Container handling volume in Tanjung Priok Port has increased continuously and it will reach the maximum handling capacity in 2015 even though the expansion plan of the container terminal will be completed on schedule.

- **Excessive congestion on port access road**

  Port users such as forwarder, trucking companies and consignor/ consignee are suffering from excessive road traffic congestion in the hinterland of the port especially within Jabodetabek (Jakarta, Bogor, Depok, Tangerang and Bekasi) area.

- **Congestion within port**

  There are shortage of port facilities including the number of berth and yard space and resulting in the congestion within the port. Even container ships scheduled for regular services are occasionally forced to wait offshore. In addition due to the shortage of container yard, container dwelling time is restricted and containers are
often shifted to off-dock yard without noticing the consignees. Hence, it is resulting additional expenses.

- Insufficient water depth and space of turning basins to receive larger container ships

Shipping lines hesitate to bring even Panamax type container ships with only 3,000 TEU capacities due to shallowness in access channel and alongside berth as well as narrowness of turning basin.

Those issues have to be tackled by Tanjung Priok Port in order to prevent problems such as congestion and inefficiency of the port, because the port has significant impact as a transport node that supports local and international trade. The development of Tanjung Priok Port demands enormous amount of investment, therefore it needs a breakthrough in port management system that is able to adapt in current condition.

3.3.3 Tanjung Emas Port

There is only one dedicated container terminal in Tanjung Emas port, which is Terminal Peti Kemas Semarang (TPKS) owned by IPC III, this port is relatively small compared with Tanjung Priok Port and Tanjung Perak Port. Container throughput of this port in 2013 only reached 499.472 TEU. Due to draft limitation and small number of available shipping lines, it is difficult for Tanjung Emas Port to expand further on its container traffic. The maximum draft is -9 meter LWS which is only accessible for container ship with maximum 1,600 TEU. The number of ship calls decreased continuously from 596 calls in 2011 to 528 calls in 2012 and finally dropped to 480 calls in 2013. This trend occurred because some of ship operators were joint slot with another operators to increase the number of containers loaded and get benefit from economic of scale, but on the other hand container throughput increased gradually.
The main hinterland of this port is Central Java, but many of the shippers in this area has decided to move its container through either Tanjung Priok Port or Tanjung Perak Port because the other ports have better flexibility on shipment schedule due to the number of shipping lines available. From interview with local authority, there is no such plan of investment to improve the infrastructure of sea basin or capacity in Tanjung Emas Port. The main function of this port is as a feeder port, which is 80% of the traffic goes to hub port (Tanjung Perak, Tanjung Priok, Singapore and Malaysia) before transported to the final destinations. Tanjung Emas Port holds an opportunity as a Central Java gateway port, the utilisation of the equipment and yard is still below 50%, less congested compared with other ports in the region.

3.4 Port governance after the 2008 shipping law

All of Port management aspects including commercial and regulation used to be controlled by the IPCs. As a single player in the market IPCs were enjoying monopolise market with no competitor in their designated geographical area.

IPCs geographical area under older shipping law:

Figure 18: IPC's designated geographical region
(1) IPC I : Aceh, North Sumatra and Riau
(2) IPC II : Jakarta, West Java, West Sumatra, South Sumatra, West Kalimantan, Lampung, Jambi and Bengkulu.
(3) IPC III : East Java, Central Java, South Kalimantan, Central Kalimantan, Bali, West Nusa Tenggara and East Nusa Tenggara
(4) IPC IV: North Kalimantan, East Kalimantan, Sulawesi, Maluku and Papua

The IPCs were act as port authority and operator as well, dominating all port services as mentioned here: port waters, pilotage, towage, stevedoring, warehousing, terminals, electricity, fresh water, training, hospital and land space for industrial area and office. According to United States Agency International Development (USAID) ports in Indonesia have relatively lack of competitiveness compared with other ports in Southeast Asia region (USAID, 2008). Low productivity in cargo handling (moves per hour) has more or less influenced the efficiency of port and increase handling cost. Shipping lines are very concerned about time delays in major ports. Some ships have to leave the port even the cargoes are not fully loaded due to delay in cargo handling, this will reduce the profit of shipping lines because they carry less cargo, and require additional cost to rent a space to third party feeders.

The shipping law of 2008 was legitimated in 7th may 2008 and effectively in force for IPCs 3 years after it is legitimated. The shipping law of 2008 was established to improve the efficiency of port governance in medium-long term. The Law has made Port Authority become port regulatory body and has removed IPC’s legislated monopoly, now the role of IPCs at least on paper has been reduced to become operator. There are four Port Authorities (PA) that has already been established: PA Belawan, PA Tanjung Priok, PA Tanjung Perak and PA Makassar. Each PA has enormous duties and responsibilities, in many cases require access to specialised knowledge and skills that are likely to be in short supply (Organisation for Economic Co-operation and Development, 2012).

Under the new shipping law, the port governance in Indonesia is able to implement a common model of port known as Landlord Port. According to World Bank Landlord Port is characterized by its mixed public-private orientation. Under this model, port authority acts as regulatory body and as landlord, while port operations (especially cargo handling) are carried out by private companies (World Bank, 2007). However, article 344 point (3) of new shipping law regards a continuous role of IPCs as a service provider in existing ports, and until now there is no bidding or concession over existing terminals. It is difficult for a new player to enter the existing port’s market, the feasible choice for new operators is to invest in a new port or joint venture with incumbent operator (IPC). The 2008 shipping law doesn’t
regulate the designated geographical areas for IPC, which means it allows IPCs to compete and invest in terminals anywhere even in other IPC’s geographical area.

3.5 Conclusion

What is presented in this chapter is a general picture of trends and development of container market in ASEAN as well as brief description of ports and terminals in Java region. Also it shows how the governments handled the port reform process and which direction they took for developing ports in Indonesia.

After doing the analysis of trend and developments, one can arise a conclusion that the demand for container terminals in Java range will remain high. Port of Tanjung Perak and Port of Tanjung Emas are more ready to receive increasing containers throughput in their terminals, but Port of Tanjung Priok seems falling behind in capacity expansion to catch up with the increasing container throughput in the next few years. It is an opportunity for Port of Tanjung Perak and Port of Tanjung Emas to attract container flows from Tanjung Priok Port that struggles with congestion and capacity.
4. Analysis of port competition

In this chapter, an analysis of container port competition in Java will be executed. This diagnostic approaches aims to reveal the opportunity for the improvement of Tanjung Perak port container throughput market share. The analysis will start with the five forces that shape the competitive landscape of Tanjung Perak port. Then, inter-port competition in Java will be discussed, to be followed by intra-port competition at Tanjung Perak port. Finally, a conclusion will close this chapter.

4.1 Five forces that shape the competitive landscape of Tanjung Perak port

Tanjung Perak port interacts with many stakeholders in its daily business, such interactions bring influence on Tanjung Perak port’s behaviour as a response from stakeholder’s forces. There are five forces that drive competitive interaction within an industry and profitability in the medium and long run (Porter, 2008). The five forces are also useful for developing long-term strategy for market positioning, this part displays the five forces that shape Tanjung Perak port competitive landscape. Five forces that interact to shape the competitive landscape of port (World Bank, 2007) include rivalry among existing competitors, threat of new entrants, potential for global substitutes, bargaining power of port users and bargaining power of service providers.

4.1.1 Rivalry among existing competitors

Rivalry among ports usually exists because one or more ports is either sense the pressure or recognise the opportunity to expand the market share. In some ports, the rivalry among existing competitors is so fierce that it reduces the profit margin of port’s service providers into minimum. In another situation, the rivalry among existing competitors is too little caused by many factors such as regulation, geographical condition, port character and other factors. The rivalry among existing competitors in Tanjung Perak port is going to be discussed in this part.

4.1.1.1 Imbalance within port capacity and demand

As mentioned before in Figure 3 that ports utilisation forecast in Indonesia was predicted to increase as a result of increasing demand of containers and stagnancy of ports in developing its capacity. Port capacity determines the degree of rivalry among ports in a region, excess of port capacity gives a pressure to gain more market share by aggressively competing with other ports. Teluk Lamong Terminal has already operated this year with 777.000 TEU of capacity, this terminal has added more capacity of Tanjung Perak port and has relieved the congestion in
existing terminals. While Tanjung Priok port is struggling with the shortage of capacity and congestion because of enormous amount of container traffic. In this circumstance, Tanjung Priok port most likely does not intend to aggressively penetrate the market in order to gain more traffic, at least until Kalibaru terminal will already have been operated in 2018. However, ports in Java region will remain in shortage of capacity as Indonesian National Development Planning Agency (Bappenas) forecasted the growth of container throughput in 2030 reaching four times than 2011 acquisition.

![Figure 19: Container traffic forecast in Indonesian ports](image)

Source: Bappenas, 2012

4.1.1.2 Improvement of hinterland market access

A distance will seem to become shorter if transportation system becomes more efficient. Hence, transport cost and delivery time are needed to be reduced to create an efficient transport system. In this case, infrastructure has significant impact for the efficiency of transportation system. Well-developed infrastructure can reduce the effect of distance between port and hinterland. Having better access of the hinterland toward any ports in a region will create port competition to attract cargo flows. Figure 20 shows that Indonesian competitiveness index on infrastructure has been increasing in the last few years.
Indonesian government has been upgrading railway lines from single track to double track which allows trains to move in different directions while sharing the same track, the railway is operated by PT Kereta Api Indonesia (PT KAI) a state owned enterprise. With double track railway, the lead time of train from Jakarta to Surabaya is reduced from 23 hour to 16 hour, it is much better if compared with truck that needs 3 days. Double track also increases the capacity of trains and containers loaded up to 70% (Wiji, 2014). In Tanjung Perak Port only TPS terminal that has direct access to the railway, while TTL is expected to connect with railway in 2015. BJTI terminal and Kalog (subsidiary of PT KAI) has already inked an agreement of joint operation of Kalimas terminal, this 32 acres terminal is located in the center of Tanjung Perak port. Kalimas terminal is expected to be a hub for container that is transported by railway. Tanjung Emas port already has railway connection, but it is not in use for many years. However, Tanjung Emas Port Authority, IPC III and Kalog have already signed an agreement of revitalisation of railway.

All of container terminals in Tanjung Priok port have not been directly connected with the railway yet. The train with containers has to stop to Pasoso railway station 2 km away from container terminals, then the container needs to be transferred into truck in order to deliver it to the terminal. This process is not efficient because it requires double handling towards container that require additional cost and time. Tanjung Priok port has difficulty over land acquisition to connect the container terminals with railways.

Those ports have been struggling to improve their connectivity in order to get better hinterland market access. There is an opportunity to gain more container traffic by developing railway connection. Railway transport has become more competitive as the government policy gradually reduces the fuel subsidy that has
an effect of more expensive truck freight rate. Furthermore, road transport has become more congested and more unreliable, even the government has invested on widening the roads. However, the growth of vehicle is too high compared with road capacity improvement.

4.1.1.3 Rivalry among hub ports

Tanjung Perak port is well known as a hub port for domestic containers because of the intensity of domestic shipping network as shown in Appendix 1, Tanjung Priok port also has the ability as a hub port, but Tanjung Perak port has a better shipping lines network for domestic routes and has strategic location for a national transport hub port. Those are the main advantages of Tanjung Perak port at the moment. However, The National Medium Term Development Plan for 2015-2019 has introduced Tol Laut concept that will create a main domestic shipping route across five hub ports in Indonesia. This concept will reduce the number of feeder ports that Tanjung Perak port currently has, because the development of new hub ports in Makassar and Bitung surely will capture the feeder ports in their area.

It will be a challenge for Tanjung Perak port if Tol Laut is successfully implemented, the reduction of feeder port may decrease the shipment activities in Tanjung Perak port for domestic cargoes. But, in the other hand the cargo flow across Tanjung Perak port becomes more rapid as a result of big ships that serving Tol Laut. The cargo stream that is brought by Tol Laut creates an opportunity for Tanjung Perak port to become a transport hub for international cargoes. Figure 10 shows the strategic location of Tanjung Perak port in the middle of Tol Laut that connect east and west corridors.

4.1.2 Threat of new entrants

New entrants in a port region bring extra capacity to absorb cargo flows, because more terminals are able to handle the cargo. It is a good news for port users because they have more options to select which port that brings more benefit for them, but it is bad news for port service providers because they have to compete with the new port that usually drags down the service prices. Obviously, a chunk of market share will be captured by the new entrants and reduces the current ports market share.

4.1.2.1 Land scarcity

The distribution of Indonesian population is uneven, about 130 million people are living in Java that constitutes 54% of Indonesian population. Jakarta holds the record for the highest population density with 21,545 people/km2. Availability of land is limited particularly in the big cities such as Jakarta, Surabaya, Semarang
and Yogyakarta. It is almost impossible to build a new port adjacent with the big cities, because a port requires a large space for infrastructure and superstructure. Investing a new container port far from a big city is too risky, it is uncertain that such investment generates sufficient profit.

4.1.2.2 Committed port development company

Indonesian Port Authority is a public entity that is directly controlled by the government, not a public owned port development company like other developed ports such as Singapore, Shanghai and Rotterdam. While from literature, the effect of not having a committed port development company are enormous. It may lead to insufficient port capacity and/or inefficient port operation, those condition will negatively impact trade and economy development (Langen P. d., Port design and management, 2014). However, based on Shipping Law 2008 Port Authority is responsible for developing ports in Indonesia and investing for a new port as well, even Port Authority is lacking of specialised knowledge and skills. (Organisation for Economic Co-operation and Development, 2012).

4.1.2.3 High capital cost for developing a new port

The high capital cost can create a barrier for new competitor. A port is known for capital intensive, it needs enormous amount of up-front expenditure for dredging the port basin, constructing sea wall, building hinterland access and construction of port superstructure. As a public entity, Indonesian Port Authority utilise public funding for port development. However, public funding may unbalance the playing field among ports, where port that receives more public subsidy has more advantages (Langen P. d., Port design and management, 2014).

4.1.2.4 Entry barrier from existing port

Shipping Law 2008 stipulates that the port governance in Indonesia implements a Landlord Port model, in which all infrastructure and land are owned by Port Authority. However, in article 344 point (3) regards a continuous role of IPCs as a service provider in existing ports. Until now, The IPCs still own the existing port areas including lands and infrastructures, except the new ports or terminals that were built after Shipping Law 2008. For instance: Teluk Lamong terminal and Kalibaru terminal, both terminal have concession agreements with Port Authority.

It is obvious that the new port or terminal will not be in a level playing field with the existing ports or terminals. The new terminal has to pay concession fee towards Port Authority, while the existing terminals owned by IPCs are free of the burden of concession fee. This circumstance constitutes a barrier for new port.
4.1.3 Potential for global substitutes

Many countries already have been affected by globalisation. Through the development of several trade agreements, it is easier for port users to shift production sources to another country in the region that affects the cargo throughput in the port.

4.1.3.1 Possibility for diverting products to other global sources

Global value chains are transforming the networks and designs of international trade. International trade agreements will need to follow the trends that sources of goods and services are now from “everywhere” rather than, as they are defined today, from “somewhere” (OECD, 2013). Indonesian participation in some multilateral or regional trade agreement could either increase the risk for loosing exports share to other global sources or in other way around increase the potential for capturing exports share. The efficiency of logistics system in Indonesia determines the competitiveness of Indonesian product, if the efficiency is successfully improved then it is low possibility for global market to shift the product to other global source.

4.1.3.2 Diversity of goods for exports and imports

Market may change their demand of goods with the substitute goods, then the foreign buyers will stop ordering current goods that they are now shipping through the port. The changing demand could heavily affect the port if the goods are the main exported commodity. Figure 21 displays top 10 export of containerised commodity in 2013, this figure is determined based on value. There are three commodities that have large shares namely electronic; rubber and tyre; and mechanical engine. Electronic and mechanical engine are general commodity, which is not addressed to a specific product, it is difficult to have substitute for all electronic and mechanical engine product. While rubber and tyre have potential for global substitutes. However, if there is a substitute for rubber or tyre, and this substitute gets rid of rubber or tyre from port, it will not give a significant effect toward port. Commodity being exported or imported through Indonesian ports is so diverse that the occurrence of global substitute will not cause serious impact toward ports. In 2012, 73% of Indonesia’s export value was delivered throughout Asia as the main trading partner. (BPS, 2014)
4.1.4 Bargaining power of port users

Port user is one of the fundamental elements for a port to survive. Ports in a region compete each other to gain more and more port users in the hinterland. However, too much bargaining power of port user often results in narrowed profit margin for port service providers, because port user would be more price sensitive.

4.1.4.1 Port users don’t have major investments in facilities in the port

Tanjung Perak port had long history being managed and operated by IPC III, during that period IPC III had heavily invested on container port facilities. All of container terminals in Tanjung Perak port area are belong to IPC III, while shippers and carriers in container sector don’t have substantial investment in port facility. The port users who don’t have a major investment in port have high bargaining power toward port, they are supposed to be able to switch to another port easily.

4.1.4.2 Transport cost barrier for moving the container to various ports

Shippers and carriers will have better bargaining power if they have more options of ports that provide the same services and if there is no cost barrier to divert to another port. Indonesia’s logistics costs account for some 24% of Gross Domestic Product, According to World Bank (World Bank, 2014). That is huge amount of tax for Indonesia’s economic growth. Transport cost for a 20” FCL container from Jakarta to Surabaya by truck is Rp. 10 million and from Jakarta to Semarang is Rp. 7.3 million (Ardyah Eko, 2013), while freight rate from Indonesia to China is only
Rp. 5 million, the high transport cost to divert the container to other ports creates a barrier for port users. This transport cost barrier has reduced the bargaining power of port users especially in captive hinterland.

4.1.5 Bargaining power of port service providers

The last force that shapes the competitive landscape of port is the bargaining power of port service providers. Port service providers are the key player of port business, the ability to bargain with port users indicates the influence on the competitiveness of the port. A variety of operators can exert bargaining power by threatening to reduce the quality of services or raise prices towards port users. A powerful service provider can also threaten to move to another port and to divert the cargo flows.

4.1.5.1 IPC III ownership of Tanjung Perak Port

Article 85 of Shipping Law 2008 stipulate that Port Authority is given the right to manage the land. This article sets the platform for implementation of landlord port model. However, the existing port’s land is under the ownership of IPCs where almost all of IPC’s assets lie in that land. It has been 6 years since the Shipping Law 2008 was introduced, Port Authority is still auditing the IPCs asset in order to split up which asset is supposed to be under Port Authority ownership and convert the value of it into concession period for IPCs. However, during this thesis writing, there is no sign for the realisation of splitting up the asset of IPCs. Tanjung Perak port’s land and superstructure still belong to IPC III.

4.1.5.2 IPC III services in Tanjung Perak port

Based on article of association of IPC III and operational permit from Ministry of Transport number: KP 88 year 2008, IPC III is entitled to provide port service as mentioned below.

1. Provision and/or service of wharf for berthing;
2. Provision and/or service of bunker and fresh water;
3. Provision and/or service of passenger and vehicle handling;
4. Provision and/or service of wharf for stevedoring of cargo and container;
5. Provision and/or service of warehouse and yard, stevedoring equipment and other port equipment;
6. Provision and/or service of terminals for container, liquid bulk, dry bulk, and Ro-Ro;
7. Provision and/or service of stevedoring of cargo;
8. Provision and/or service of distribution centre and cargo consolidation; and
9. Provision and/or service of tug boat for vessel.

This almost covers all of port services. IPC III has some subsidiaries that operate in Tanjung Perak port, including three major container terminals TPS, BJTI and TTL. IPC III also has PT Pelindo Marine Service (PMS), PT Portek Indonesia (Portek) and
PT Rumah Sakit Primasatya Husada Citra (RS PHC). PMS provides tug boat and pilotage services, ship docking and maintenance, ship crewing and operating services. Portek provides handling equipment for dry bulk, maintenance of port’s equipment and ICT for terminal services. RS PHC is a hospital that provides medical services. Those firms gain benefit from agglomeration of port related industries in Tanjung Perak port.

Figure 22: IPC III’s subsidiaries operated in Tanjung Perak port and its shareholders

Source: IPC III annual report

The existence of IPC III in Tanjung Perak port is extremely important because IPC III has become the backbone of port operations in Tanjung Perak port. Through horizontal integration of port operation IPC III creates a monopoly in the industry, and then it makes IPC III have high bargaining power as a port service provider.

4.1.6 Conclusion

Based on the five forces analysis, one can conclude that the dominant actor in Tanjung Perak port is IPC III. Although the Shipping Law 2008 has got rid of the regulatory function from IPCs into a new governmental entity which is Port Authority, IPCs become stronger because of horizontal integration of port services. The analysis indicates that the rivalry from existing ports is most likely to be a potential threat for Tanjung Perak port in the future, because of the improvement of hinterland infrastructure makes the port users probably choose to divert the
cargo flows to competitor ports easily. Furthermore, the Toll Laut development plan will open up competition among hub ports in Indonesia.

4.2 Review on inter-port competition in Java range

In order to be able to grasp the degree of inter-port competition of container ports in Java range, some key factors that affect inter-port competition need to be analysed. The key factors consist as follows: geographic location, legal framework, financial resources, institutional structure, efficiency and price and image of port (World Bank, 2007).

4.2.1 Geographic location

Jakarta, Semarang and Surabaya are connected by 727 km road line which is called Pantura. This road is heavily congested by trucks, private cars and public vehicles, it takes about 3 days for a truck to travel from Jakarta to Surabaya. With road congestion across Pantura, the shippers in captive hinterland area cannot easily diverting their container to other ports, preferring instead to find the closest port, because of time lag and high transport costs. This situation makes barrier for other ports to enter the market and to compete with the current port in term of services.

In May 2014, the state owned railway operator PT KAI finished the construction of double track railway lines across Jakarta, Semarang and Surabaya. With double track railway line, it only takes about 16 hours for transporting containers from Jakarta to Surabaya and it is cheaper than truck. However, the facility for transferring the container from truck to train or vice versa is not developed yet, only few dry ports or distribution centres in hinterland area that are connected by the railway. Furthermore, there is only one container terminal that is directly connected with railway which is TPS in Tanjung Perak port. Railway holds the potential to create inter-port competition in Java only if supported with better transfer facilities and better connection to the terminals. According to PT KAI, the construction of double track railway lines across the southern of Java will be finished in 2017. This project will complement the double track railway in northern of Java that has already been operated.
Tanjung Priok port has been enjoying the advantages of -14 meters LWS draft of their terminals that cannot be provided by its competitors. In 2015, Tanjung Perak port will have -14 meters access channel from APBS project, this will be expected to open the barrier for big ships to enter Tanjung Perak port and give Tanjung Perak port a level position with Tanjung Priok port.

Tanjung Perak holds the potential as a hub sea port of Indonesia because this port has strategic geographical location in the centre of Indonesian archipelago (Figure 1). Tanjung Perak port currently is a transport hub for domestic containers. Therefore, all of major local shipping lines have their head quarter located in Tanjung Perak Surabaya.

4.2.2 Legal framework

The shipping law 2008 introduces the foundation of a significant change of the Indonesian port’s system. The law eliminates the IPC’s legislated monopoly on port sector and open the door for private sector to participate in port investment. With private sector participation, the government aims to create port competition in order to put pressure on price reduction and to enhance the quality of port services.

4.2.3 Financial resources

Port Authority is a governmental unit under Ministry of Transport institution, which means every funding on investment of port development comes from state budget. It takes years from planning for public funding to its realisation, and even it may be changed from initial plan because of political pressure. Indonesian government has a plan to expand ports across the world’s biggest archipelago, $ 6 billion is required to do so. The government could fund the port project by cutting off about a quarter of fuel subsidies for 2015 that reaches $ 23 billion (Rieka, 2014).

IPCs have capacity to raise the funds required to invest on development or improvement of port facilities. In 2014, IPC III made a successful debut on global capital debt market with the issuance of bond worth $ 500 million (Vincent, 2014).
This fund will be used to improve IPC III’s terminals capacity. Meanwhile, IPC II has a plan to issue $1 billion in bond in 2015. IPC II aims to construct 22 sea ports across the country (Choirul, 2014).

4.2.4 Institutional structure

Shipping law 2008 stipulated to create a new governmental institution that has responsibilities as a port regulator. For now, there are four Port Authorities already established. According to shipping law 2008, the definition of Port Authority is a government entity in port sector as an authority that performs the functions of regulatory, control and supervision of port’s activity which is commercially operated. In the absence of business function, the Port Authority isn’t even keen on capturing port’s throughput market share and competing with other ports. From the interview with Port Authority of Tanjung Perak, the responsibilities of Port Authority are drafting of port’s regulations, supervision of port performance, determining the service level, and infrastructure planning and development, nothing to do with increasing port’s competitiveness or market share. On the other hand, the port’s service provider as a business entity has corporate goals that mainly increase the company’s profitability and the level of market share. Furthermore, the port’s service provider has to repay the investment to its shareholders, not like Port Authority that uses public funding to invest on infrastructure. This gap needs to be communicated to the Port Authority to harmonise each entity of goals, so that the ports become more conducive for private sector investment.

Container terminal at Tanjung Emas port is owned by IPC III and managed as a company’s branch at Semarang. The institutional proximity not only happens in terminal sector, but also in Port Authority sector. Tanjung Emas port is under designated area of Port Authority of Tanjung Perak. This institutional and organisational proximity open an opportunity between Tanjung Perak port and Tanjung Emas port to collaborate in order to strengthen their market by creating coopetition relationship. Meanwhile in Tanjung Priok port is owned by IPC II and under designated area of Port Authority of Tanjung Priok. The difference of institutional proximity among these ports affect the degree of port competition and/or port cooperation.

4.2.5 Efficiency and price

As mentioned before that Indonesia’s logistics costs account for a quarter of Gross Domestic Product, this indicates the inefficiency of Indonesia’s logistic system. Port as a part of logistic chains plays important role on the efficiency of a logistic
system, therefore Port Authority has responsibility to setup the service level of each port service provider in order to prevent port’s inefficiency.

The private sectors are observing the opportunities to participate in port services, the crucial thing that has been private sector’s concern is the liberation of pricing without any government intervention. The shipping law 2008 in text enables port operators to determine their own tariffs. However, the government still influence the processes of tariff approval. According to article 110 point (2) Shipping Law 2008:

"Port service tariffs will be determined by port operators based on tariff types (jenis), structure (struktur) and categories (golongan) as determined by the government”

4.2.6 Image of the port

Indonesian ports have long track record that shapes bad images of the ports itself. Ports are often correlated with congestion, illegal levies, thugs, pollution, etc. Tanjung Perak port through its prestigious project Terminal Teluk Lamong, has desire to change the bad image of this port. TTL is the first and yet the only terminal in Indonesia that has a green concept, which is all of the equipment and trucks inside terminal area are powered by electricity and gas. TTL is equipped with new container cranes and the latest technology of terminal operation software this will relieve the congestion and gradually increase the port’s image toward port users. However, increasing the port’s image needs commitments and participation from many port actors that have influences, such as: customs, quarantine department, coastal guard, immigration department, municipality, etc.

4.2.7 Conclusion

Based on the analysis of inter-port competition, one can conclude that the degree of inter-port competition within container ports in Java is relatively low. However, it will start to get more fierce if the railway infrastructure is successfully integrated with ports and hinterlands as well. Lack of cognitive proximity within port service provider and Port Authority may create barriers that hamper inter-port competition. That is why the role as a port entrepreneur is taken over by port service providers as the Port Authority doesn’t have business function toward ports. Inter-port competition analysis also has revealed a potential cooperation relationship between Tanjung Perak port and Tanjung Emas port as both ports have institutional and organisational proximity.
4.3 Review on intra-port competition in Tanjung Perak port

Ultimately, only one company is involved with container handling activities at each container port in Java, examples: IPC II owns 3 terminals in Tanjung Priok port and IPC III owns the only terminal in Tanjung Emas port and 4 terminals in Tanjung Perak port. Holding such a dominant market power, one can say that IPCs are actually monopolists, not only in the container handling activities but also in other services. This horizontal integration strategy may reduce intra-port competition, but on the other hand it may increase market share by using economies of scale and economies of scope abilities. However, this increases the risk of abuse of market power.

The Port Authority prevents the abuse of market power from dominant players in ports by intervention on port’s tariff. According to Ministry of Transport Law PM 6 year 2013 and PM 15 year 2014, the terminal operator needs to “consult” with the Ministry before the terminal operator sets up the final tariff, if there is only one operator providing the service at a port. The word “consult” means, the terminal operator has to pass several processes as follows:

1. The operator arranges the draft of tariff attached with considerations and calculations;
2. The draft needs to be approved by some stake holders such as: Indonesia National Shipowners Association, Indonesia Stevedore Association, Indonesian Exporter Association, Indonesian Importer Association, Indonesian logistic and forwarder Association, and under acknowledgment of Port Authority.
3. After being approved by the stake holders, finally the draft needs approval towards Ministry.

Tanjung Perak port is considered as a single operator by Port Authority, even there are TPS, BJTI and TTL. That is why IPC III needs to follow the above mentioned procedure to setup the tariff. Hence, there is only single tariff applied for all terminals at Tanjung Perak port.

Although the ownership of 4 container terminals belongs to IPC III, each terminal is an independent business entity that has their own company’s goals. Those terminals are eager to increase its container throughput. However, IPC III has implemented the “Klasterisasi” towards its terminals which limit the intra-port competition (Hamid, 2014). Klasterisasi means terminal specialisation for domestic or international containers, for example: BJTI is dedicated terminal only for domestic containers and TPS is dedicated terminal only for international containers. One of the reasons of implementation of this system is because BJTI has smaller draft than TPS, the domestic container ships are dominated by smaller ships with small draft.
Container terminals at Tanjung Perak port have differences in draft. The smallest draft is -6.5 meters LWS that is located in Cabang Perak terminal and BJTI terminal. While TTL has advantage as a deep sea terminal with -14 meters LWS draft. Therefore TTL is able to receive bigger ships. These draft differences limit intra-port competition, because terminal with small draft is unable to receive ships with bigger draft. Hence, terminals with bigger draft most likely will enjoy monopoly of big ships services.

The Minimum Efficient Scale (MES) is important for both Port Authority and terminal operators. MES helps Port Authority to determine how many competing terminal operators should be at the port. For terminal operators, MES could be used for developing expansion strategy in port (Notteboom, 2010). According to the literatures, the average scale of container terminals in Europe and North America is to be somewhere around 400.000-600.000 TEU (Langen P. d., Port design and management, 2014). Port characteristic in Indonesia is different with port characteristic in Europe and North America as well, Indonesia’s ports have smaller size of terminals and vessels, which may have smaller MES. Table 5 presents the terminal’s container throughput at Tanjung Perak port in 2013, the container throughput of each terminal exceeds the MES that may imply the possibility to add more terminal operators.

Table 5: Container throughput 2013

<table>
<thead>
<tr>
<th>Terminal Petikemas Surabaya (TPS)</th>
<th>Berlian Jasa Terminal Indonesia (BJTI)</th>
<th>Cabang Perak</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.341.835 TEU</td>
<td>919.005 TEU</td>
<td>733.092 TEU</td>
</tr>
</tbody>
</table>

Intra-port competition in Tanjung Perak port is relatively low, because of the intervention by the holding company (IPC III) toward terminals in Tanjung Perak port which are its subsidiaries. This condition is considered as too high intra-port proximity.

4.4 Conclusion

This chapter has provided some analysis related to port competition. The first section gave an overview of 5 forces that interact to shape the competitive landscape of Tanjung Perak port. Then, inter-port competition in Java range has already been displayed. At last, intra-port competition in Tanjung Perak port has
already been examined. All of the analysis as discussed in this chapter can be summarised in Table 6.

Table 6: Overview of port competition analysis

<table>
<thead>
<tr>
<th>5 Forces</th>
<th>Conclusion</th>
<th>Opportunity for market share improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The dominant actor in Tanjung Perak port is IPC III. IPCs become stronger because of horizontal integration in port services. The main thread of Tanjung Perak port comes from the existing competitor Tanjung Priok port.</td>
<td>The improvement of hinterland infrastructure has paved the way for Tanjung Perak port to penetrate its market into competitor's hinterland. Furthermore, Tanjung Perak port has an opportunity to become transport hub for international containers if Toll Laut is successfully implemented.</td>
</tr>
<tr>
<td>Inter-port competition</td>
<td>The degree of inter-port competition within container ports in Java is relatively low. However, it will start to get fierce if the railway infrastructure is successfully integrated with ports and hinterlands as well. Lack of cognitive proximity within port service provider and Port Authority may create barriers that hamper inter-port competition.</td>
<td>IPC III can lead the port entrepreneurship in order to gain more port’s market share. Inter-port competition analysis also revealed a potential cooperation relationship within Tanjung Perak port and Tanjung Emas port as both ports have a close institutional and organisational proximity.</td>
</tr>
<tr>
<td>Intra-port competition</td>
<td>Intra-port competition in Tanjung Perak port is relatively low, because of the intervention by the holding company (IPC III) toward terminals in Tanjung Perak port which are its subsidiaries.</td>
<td>Creating intra-port competition among container terminals in Tanjung Perak port.</td>
</tr>
</tbody>
</table>
5. Factors of port selection and Stakeholders opinions on identified problems.

In this chapter will be divided into two parts. In the first part, the data collection from survey as well as the analysis will be presented. There is one essential goal of this data analysis which will be examined. The goal is to find the main factors of port users in Java consider in choosing which port as the destination for loading or discharging their container. Subsequently, in the second part the interviews about the major reason for the decrease of Tanjung Perak port’s container throughput market share will be presented.

5.1 Result from the survey

The surveys were sent to shippers, forwarders and shipping lines in central Java by emailing the web link of the questionnaire to the port user’s email that was obtained from websites and from Ministry of Trade and Industry. The surveys were also brought to the port users for face to face completion. The survey consist of three questions which are: (1) What are your reasons for selecting current port? (as a destination for loading/discharging of containers in Java)?, (2) What are the factors that you will consider to shift into a more expensive port?, and (3) Response a number of port preposition provided. The survey’s questions were similar to survey conducted by Peter de Langen toward Austrian shippers and forwarder (Langen P. W., 2007). The respondents were asked to select their response toward statements whether they strongly disagree, disagree, neutral, agree or strongly agree with the various port selection criteria. The survey format is provided in Appendix 3.

5.1.1 Response rate

About three hundred fifty one surveys were initially sent to forwarders and shippers by email. However, eighty six surveys were unable to be delivered due to the failure on email recipient. Finally, only 11 responses were obtained by email, but from 11 respondents only 9 respondents gave complete answers. Then the author decided to give the survey directly to the port users in face to face completion and obtained 10 extra respondents, so in total only 19 respondents were obtained. This survey is relatively low in response, the difficulty to obtain respondents not only encountered this survey, but also similar survey that was conducted toward port users. However, from the survey result, it is enough to generate idea to find the
factors of port selection. In order to get the value from each factor which is provided, the survey result will be calculated to find its Average Means (Avg. means)

Avg. Means = [(SD*1)+(D*2)+(N*3)+(A*4)+(SA*5)] /Total respondents

5.1.2 Reasons for selecting current port (as a destination for loading/discharging of containers in Java)

<table>
<thead>
<tr>
<th>Port selection criteria (Avg. means)</th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency and quality shipping services Location of port (3.7)</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>13</td>
<td>2</td>
</tr>
<tr>
<td>Quality terminal operating companies (3.9)</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>Quality of equipment (3.7)</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>Quality connection to hinterland services (3.5)</td>
<td>1</td>
<td>1</td>
<td>6</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>Location of port (4.2)*</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>9*</td>
<td>8*</td>
</tr>
<tr>
<td>Faster custom clearance services (3.8)</td>
<td>0</td>
<td>1</td>
<td>6</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Better ICT service (4.1)*</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>8*</td>
<td>7*</td>
</tr>
<tr>
<td>Customer focus in port (3.9)</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td>Good reputation related to delay and damage (3.5)</td>
<td>0</td>
<td>2</td>
<td>6</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>Personal contact in port (3.9)</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>9</td>
<td>4</td>
</tr>
</tbody>
</table>

*High frequency of agree than other factors

Table 7 displays that almost all of the port users agreed for all above mentioned port selection criteria, these ten factors influenced the port user’s decision to determine their current port as the destination of loading or discharging their containers. The strongest factor pointed by the port users is “Location of port”, which consists of 8 of respondents choosing strongly agree and 9 of respondents choosing agree, this result provides evidence that the distance from hinterland to port or vice versa is really matter. The inefficient of transport system is considered as the main cause of the port user’s decision to prefer a closer port. Apparently, Information and communication Technology (ICT) service is the second strong factor pointed by the port users, which consists of 7 of respondents choosing strongly agree and 8 of respondents choosing agree. This indicates that the complexity of coordination with various parties is considered as problem, ICT is needed to reduce the transactional cost during all steps required for shipment of containers.
5.1.3 Reasons for selecting a more expensive port

Table 8: Reasons for selecting a more expensive port

<table>
<thead>
<tr>
<th>Port selection criteria (Avg. means)</th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location of port (3.8)</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>Efficiency of port (3.9)</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Frequency and quality shipping services (3.9)</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>13</td>
<td>4</td>
</tr>
<tr>
<td>Quality connection to hinterland services (3.8)</td>
<td>1</td>
<td>0</td>
<td>4</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>Customer focus in port (4.0)</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>13</td>
<td>4</td>
</tr>
<tr>
<td>Better ICT service (4.0)</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>11</td>
<td>5</td>
</tr>
<tr>
<td>Availability of connection to hinterland service (3.9)</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>12</td>
<td>4</td>
</tr>
<tr>
<td>Better reputation related to delay (3.9)</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>Personal relations (3.2)</td>
<td>1</td>
<td>3</td>
<td>8</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Faster custom clearance services (3.9)</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Better port’s equipment (4.1)*</td>
<td>1</td>
<td>0</td>
<td>3</td>
<td>7</td>
<td>8</td>
</tr>
</tbody>
</table>

*High frequency of agree than other factors

Table 8 shows that respondent agreed toward all reasons for selecting a more expensive port mentioned above, except ‘personal relations’ that indicates many hesitations. The respondents acknowledged that the reasons shall have direct effect on transport costs or supply chain costs. The more impact of the reason toward transport cost, the more important the reason is. The ‘customer focus in port’ appears to be an important issue, it is proven with high frequency of ‘agree’. This may indicate the port’s arrogant attitude towards the port users.

5.1.4 Responses of port selection

Table 9: Responses to a number of port selection propositions

<table>
<thead>
<tr>
<th>Port Preposition (Avg. means)</th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port choice is based on historical reasons /tradition (3.0)</td>
<td>1</td>
<td>6</td>
<td>3</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>Port choice is based on personal relation in port (3.4)</td>
<td>0</td>
<td>2</td>
<td>7</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Port choice is based on (perception of) price (4.1)*</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>9*</td>
<td>6*</td>
</tr>
<tr>
<td>Port choice is based on (perception of) quality of port (4.0)*</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>12*</td>
<td>4*</td>
</tr>
<tr>
<td>Total port costs are important but not decisive in port selection (3.5)</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>11</td>
<td>1</td>
</tr>
<tr>
<td>Quality and service determine port choice, as long as the price does not exceed a certain level our company is willing to pay (3.9)*</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>11*</td>
<td>3*</td>
</tr>
<tr>
<td>A lower price can compensate a lower service level (3.4)</td>
<td>0</td>
<td>6</td>
<td>4</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>When more ports offer attractive price/quality, cargo is distributed over various ports (3.8)</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td>Port choice is continuously re-assessed (3.8)</td>
<td>0</td>
<td>0</td>
<td>7</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>If our current port provides satisfactory services, there is no reason to change ports, even if price advantages exist (3.9)</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>10</td>
<td>4</td>
</tr>
</tbody>
</table>

*High frequency of agree than other factors
Table 9 displays that the perception of price and quality are essential factors of port choice, those perception are determined by the performance of terminal operators in the port. The result also indicates that the port users can tolerate certain level of price for compensate port’s quality. Price and quality are mainly delivered by terminals in a port to port users, hence the quality of terminal operator is an essential factor of port selection.

5.1.5 Conclusion

This chapter has analysed the data from the survey. The main findings from the survey may be summarised as follows:

1. The dominant factors which port users at Java consider when choosing which port as the destination for loading or discharging their container are: geographical proximity, information service in port and quality of terminal operator.
2. From the survey result, it can be revealed that the more impact of the factor toward transport cost, the more important the reason is for port users.

5.2 Findings from interviews about major reason for the decrease of Tanjung Perak port’s container throughput market share

In the previous chapters have discussed the analysis of Java’s container ports according to literatures. This chapter will display several findings from interviews with some practitioners, people who are currently active or closely involved with container ports activities in Java. For this objective four institutions (Port Authority, IPC III, Terminal Petikemas Surabaya and Terminal Teluk Lamong) have been asked to give their opinion about major reason for the decrease of Tanjung Perak port’s container throughput market share. The results can be clustered as follows;

1. Lack of hinterland connectivity

From four interviewees, all have said that lack of hinterland connectivity especially to the contestable hinterland has troubled Tanjung Perak port to expand its market. The container transport depends too much on trucks that more expensive and unreliable.

2. Natural barrier

All the interviewees claimed that the natural barrier which is shallow access channel of Tanjung Perak port has certainly contributed to the decline of container throughput market share. However, West Surabaya shipping channel is being dredged to meet the requirement for big ships to enter Tanjung Perak port.
3. Lack of inter-port competition

Two interviewees shared view that lack of inter-port competition has certainly contributed to the decline of container throughput market share. IPC III has majority share in all container terminals in Tanjung Perak, compared with Tanjung Priok whose the two biggest container terminals which are JICT and Koja have different majority shareholder.

The interviewees pointed out that the lack of infrastructure quality is the major cause for the decrease of Tanjung Perak port’s container throughput market share. However, the port’s infrastructure is undergoing quality upgrading such as double track railway and APBS project, therefore the interviewees are expecting the hike of container throughput growth next year. Lack of inter-port competition was remarked only by two interviewees. Hence, the lack of inter-port competition is not regarded as dominant factor for the decrease of Tanjung Perak port’s container throughput market share.

5.3 Conclusion

The survey to find the main factors of port choice was presented in this chapter, as well as the interviews about major reason for the decrease of Tanjung Perak port’s container throughput market share.

Even though the survey was relatively low in response, but it is enough to generate idea to find the factors of port selection. The main findings from the survey indicate that the dominant factors which port users at Java consider when choosing which port as the destination for loading or discharging their container are: geographical proximity, information service in port and quality of terminal operator.

According to the interview conducted with port authority and terminal operators, the lack of inter-port competition was not regarded as dominant factor for the decrease of Tanjung Perak port’s container throughput market share. Although according to the scientific literature, inter-port competition creates conditions for the competing operator to improve terminals performance to their customers. On the other hand, according to the survey results, the quality of terminal operator is an essential factor for port choice. This gap can be considered as a weakness of Tanjung Perak port.
6. Strategies for improving Tanjung Perak port’s container throughput market share

This chapter will display the strategies to improve Tanjung Perak port’s container throughput market share. It will start from analysis of some world’s container ports towards their strategies to improve container throughput market share. This analysis contains success stories of ports on developing their container throughput. Subsequently, based on all analysis in previous chapters and comparative analysis, typology of inter-port competition will be developed. Finally, the strategies for improving Tanjung Perak port’s container throughput market share will be proposed.

6.1 Comparative analysis

6.1.1 Hamburg and Bremerhaven

Hamburg and Bremerhaven ports are examples of successful case of the development of hinterland transport that enhance container throughput market share. Port of Hamburg has experienced container throughput growth in the last few years, thanks to railways network over its hinterland that is able to transport 2 million TEU of containers every year in this port. The amount of containers handled by train constitutes 30% of annual Hamburg’s container throughput, compared with Rotterdam and Antwerp with just 10% of annual throughput is transported by train (M. Acciaro, 2013). Hamburg Port Authority is responsible for 300 km port’s railway network, 92 train operators are licensed to operate trains along the railway network infrastructure. In 2013, Hamburg was able to handle approximately 200 trains per day, this trains are expected to increase double in the next 10 years. While Bremerhaven has succeeded a modal split of container, with over 45% of annual container throughput being transported by train.

6.1.2 Hong Kong and Shenzhen

Ports in the South of China region compete against each other, but at the same time they works together for mutual benefit, this relationship is called coopetition. The alliance and consortia of shipping lines increase the market power of the shipping liners against ports in South of China, with the ability to choose port of call, the shipping lines are even able to negotiate the favourable service prices and conditions towards port operator. In order to respond to the decline of market...
power, the container ports of Hong Kong and Shenzhen use coopetition strategy among ports in the region. The coopetition has been proven effective on increasing port’s market power. The strategic step to implement the coopetition is equity joint venture of major port operation players. With joint venture among port operators in the area, both Hong Kong and Shenzhen can gain more market power without losing the flexibility and speed required to enter new markets. Fierce competition can lead to destructive competition, in this case Ports in Hong Kong and Shenzhen choose to be more cooperative to strengthen their market power.

6.1.3 Port Klang and Tanjung Pelepas

Port Klang is located in adjacent to Malaysia’s capital Kuala Lumpur, while Tanjung Pelepas is located in the state of Johor at the southern tip of peninsular Malaysia. Those ports succeed in gaining more container throughput in Malaysia and also reducing Singapore’s container throughput market share by creating reliable alternative for transhipment operation. Although Singapore is still the largest transhipment port in Southeast Asia, the development of Port Klang and Tanjung Pelepas has a negative impact on Singapore’s container throughput. The creation of a reliable alternative for transhipment operation has affected the movement of some shipping line’s transhipment hub from Singapore to those ports, for instance: Port Klang has become a transhipment hub for CMA-CGM and China Shipping, while Tanjung Pelepas has become a transhipment hub for Evergreen and Maersk for some routes (J. S. L. Lam, 2008). The key success of these ports is to create and sustain a port’s connectivity in terms of shipping network. That is not a simple task because it needs a viable feeder ports network and some major liners to serve transhipment activity.

6.1.4 Shanghai and Ningbo

The Eastern part of China around Yangtze River Delta has experience rapid growth of economy, the port of Shanghai and Ningbo have both benefited from increasing container traffic in the area. Shanghai as an international shipping hub is facing increasing competition from Ningbo, both have hinterland area that overlaps each other. Shanghai now remains the world’s biggest container port in term of throughput, but Ningbo seems to be a threat for Shanghai because of unique characteristic of deep water port owned by Ningbo. In 2010, the Ningbo’s container throughput reached 13 million TEU, with annual increase of 39.4% since 1995 (N. Liu., 2010). However, the inter-port complementarity within Shanghai and Ningbo did exist in the past. Shanghai didn’t have sufficient water depth to handle big vessels, therefore Ningbo was designed to become a complementary port for
Shanghai. The complementary cooperation allows ports to create win-win solution in order to enhance profit for both sides.

6.1.5 Conclusion

All of the key success of above mentioned ports can be summarised in Table 10

<table>
<thead>
<tr>
<th>Ports</th>
<th>Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hamburg and Bremerhaven</td>
<td>Vertical integration to port’s railway network management and optimise the railway connections for container transport toward hinterland</td>
</tr>
<tr>
<td>Hong Kong and Shenzhen</td>
<td>Creates coopetition relationship with joint venture among port operators in the area</td>
</tr>
<tr>
<td>Port Klang and Tanjung Pelepas</td>
<td>Create and sustain a port’s connectivity in terms of shipping network in order to secure the container flow as a hub port</td>
</tr>
<tr>
<td>Shanghai and Ningbo</td>
<td>Inter-port complementarity since Ningbo has sufficient water depth to handle big vessels and Shanghai has extensive shipping network</td>
</tr>
</tbody>
</table>

6.2 Typology of inter-port coopetition

Ports that have geographical proximity interact each other in a relationship. The relationship of ports can be differentiated into competition and cooperation. When incorporated with the intensity of the relationship between low and high, it will create four characteristics of typology namely:

1. High competition and Low cooperation

This port is in the situation of fierce competition between existing competitors and new entrants, which might result in racing to the bottom in order to attract more traffic. The mobile actors such as shipper and shipping line are able to exploit the circumstance by threatening switching to another port that has cost benefit for them. Examples of ports in this case are Tanjung Pelepas and Singapore port. Tanjung Pelepas has succeeded in attracting Maersk Line container ship traffic in expense of decreasing of Singapore container throughput market share.
2. Low competition and Low cooperation

This is the ports that will run the risk of losing the port’s competitiveness, hence decreasing port’s market share. With only little collaboration in port development, the ports are fronted by problems of innovation, market access, efficiency and so on. This circumstance is an ideal situation for external competitor to capture the market. Examples of port in this position are the adjacent Tanjung Perak port and Tanjung Emas port in Java. Those ports are losing container throughput market share from its main competitor Tanjung Priok port.

3. Low competition and High cooperation

This port is in the situation of benign competition among its competitors. The players are in the position of close relationship and tend to protect their dominant position. The dominant players enjoy spatial monopoly because of entry barrier from any kind of competition. Hence, the port user will suffer from unrealistic port costs and lack of efficiency. This had been a case in Israeli ports, all ports were under national monopoly of Israel’s Port Authority as the owner and operator of commercial ports (World Bank, 2007).

4. High competition and High cooperation

This circumstance is considered as coopetition because the high degree of collaboration without diminishing the intensity of competition. Those ports perform a win-win strategy instead win-lose in forming strategic alliance with their competitor. The coopetition enables the ports to have resource pooling and risk sharing by creating joint ventures. Examples of port in this position are port of Hong Kong and Shenzhen. Through joint venture, Hong Kong port operator can access the new market in Chinese mainland.

<table>
<thead>
<tr>
<th>Competition</th>
<th>Cooperation</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Risk of destructive competition and opportunism of key players</td>
<td>(Coopetition) Win-win strategy; ability of resource pooling and risk sharing</td>
</tr>
<tr>
<td>Risk of losing competitiveness and lack of innovation</td>
<td>Dominating players have potential for spatial monopoly</td>
</tr>
</tbody>
</table>

Table 11: Typology of inter-port coopetition
This typology can be used to identify the relationship strategy between two ports and its current impact as well. Relationship between Tanjung Perak port and Tanjung Emas port is now at the position of low competition and low cooperation. In order to increase its container throughput market share, Tanjung Perak port should choose which strategy is suitable to achieve its goals. Low competition and high cooperation surely are not an option, because Shipping Law 2008 demanded to reduce the monopoly position of IPCs. Next, high competition and low cooperation can be implemented toward relationship between Tanjung Perak port and Tanjung Priok port, this competition will bring benefit for most of port players. Shipping lines in Indonesia currently do not have big enough of market power, so it is safe to be implemented in those ports because it is small chance of opportunism by shipping lines. Finally, high competition and high cooperation can be implemented toward relationship between Tanjung Perak port and Tanjung Emas port. Since those ports have the same terminal operator which is IPC III, the suitable strategy for these ports is coopetition. That means Tanjung Perak port and Tanjung Emas port need to increase the degree of competition and cooperation more than before.

6.3 Strategies

This research comprises of diagnostic study to pinpoint the issues that Tanjung Perak port needs to be aware of improving their container throughput market share. Subsequently, from the analysis conducted in previous chapters, imperative strategies toward Tanjung Perak port are suggested:

6.3.1 Railway integration

The congestion on road transport is the main cause of the Indonesia’s high logistics costs. Furthermore, it makes captive and contestable hinterland of Tanjung Perak port more limited. The solution that most suggested is the improvement of railway transport share. This alternative of transport mode has substantial advantages on transport cost reduction, faster delivery time and lower environmental impact. However, the railway transports are generally less flexible because it cannot provide door to door transport. Furthermore, it require increased coordination as multiple entity engaged with this transport mode (M. Acciaro, 2013).

In order to overcome the disadvantages of railway transport for Tanjung Perak port, there are two strategies suggested. First is the development of upstream and downstream infrastructure. Sea port as an upstream transport chain should have efficient inter modal system to ensure the seamless transport corridor. Currently
TPS is the only port that has direct railway access to its terminal. TTL, BJTI and Cabang Perak don’t have direct access of railway although the railway line is nearby from their terminals. For this purpose, port authority, IPC III and PT KAI can collaborate in order to create railway network inside port area. The downstream infrastructure that consist of intermodal terminals is very important for hinterlands intermodal facilities to extend its connectivity and flexibility. In addition, dry port concept should be implemented as well. The benefit of dry port implemented in transport chain is the ability to improve supply chain, to enhance local competitiveness and to reduce negative externalities (Bergqvist, 2013). Figure 24 shows the railway network concept.

Second is the vertical integration on rail way transport network to ensure a better coordination among all actors. The coordination among actors is required to create effective hinterland transport chain (van der Horst M. R., 2008), therefore it needs a strategic partnership that enables lower transaction cost for both rail operator and seaport. The benefits of effective coordination include reduction of operational costs and increased service level to the customers. Joint venture cooperation between BJTI and Kalog to develop Kalimas terminal in Tanjung Perak port is the example of strategic partnership in railway network. For this purpose, IPC III and PT KAI can collaborate in developing railway network by creating dry ports in hinterland area. The collaboration can be done by creating a joint venture company that will be responsible for managing railway cargo flows through sea ports and dry ports. Subsequently, ICT integration needs to be developed within seaport, dry ports, operators, customs and shippers that allow better efficiency, coordination and information service as needed by the customers.

Figure 24: Rail network concept
6.3.2 Coopetition between Tanjung Perak port and Tanjung Emas port

Tanjung Perak port is known as a hub port for domestic containers because of the high connectivity of domestic shipping services as displayed in Appendix 1, but Tanjung Perak port is also known as a feeder port for various international hub ports as displayed in Appendix 2. Tanjung Perak port’s shipping service network is larger than Tanjung Emas port. Furthermore, according to Tol Laut concept Tanjung Emas port will not be included as a hub port. But in term of location toward hinterland in Java Tanjung Emas port has advantage because it is located in Central Java that has better proximity to enter the hinterland markets either in East Java or West Java. Therefore coopetition within these two ports can be developed to complement each other without diminishing the degree of competition in order to gain more market share.

Coopetition is a blend of competition and cooperation that considers win-win strategy rather than win-lose (Song D. W., 2003). Coopetition may be introduced in ports both by operators wishing to increase their profits and port authorities attempting to make economies of scale for economic development (Song, 2002). For this purpose, Tanjung Perak port and Tanjung Emas port can collaborate on infrastructure, transportation synergy, research and development, regional marketing, and so on. Through collaboration with Tanjung Emas port, Tanjung Perak port can obtain the benefit of increased and spare capacity as well as improved capacity utilization.

6.3.3 Unleash intra-port competition

According to the intra-port analysis conducted in previous chapter, it is indicated that intra-port competition in Tanjung Perak port is relatively low, because of the IPC III ownership toward all terminals in Tanjung Perak port. This too much intra-port proximity bears the risk of undermining the processes of learning and innovation (Peter V. Hall, 2009). Hence, In order to increase the degree of intra-port competition within terminals, the IPC III can withdraw its interventions against operational aspects and promote competition toward terminals. The relationship between the terminals illustrated in Figure 25.
There are two options to improve intra-port competition in Tanjung Perak port. First is to introduce a new container terminal which is owned and controlled by non IPC III entity. According to MES analysis, it is still possible to add more terminals in Tanjung Perak port area. Or second is the privatisation of existing terminals. In order to reduce IPC III’s control toward all terminals, IPC III may release its position as a majority shareholder in a terminal by selling a part of its share to a credible operator. This strategy was already implemented by Tanjung Priok port. The biggest container terminal in Jakarta JICT has a majority shareholder from non IPC II entity, which is a multinational company Hutchison Port Holding Group.

6.4 Conclusion

Comparative analysis indicates the collaboration with a partner that has geographical proximity is potential to gain throughput market share and market power. Tanjung Perak port and Tanjung Emas port hold potential to improve their container throughput market share over coopetition between these ports. Creating a coopetition relationship can be done by collaborating on infrastructure, transportation synergy, research and development, regional marketing, and so on.

Congestion on road transport in Java has led logistic costs become more expensive and more unreliable. Hence, shippers choose geographical proximity as the most important factor of port selection. Tanjung Perak port has been struggling to expand its captive and contestable hinterlands. Therefore, the solution that most suggested is the improvement of railway transport share. For this purpose, IPC III can initiate a collaboration with PT KAI in developing railway network within port area and creating dry ports in hinterland area.
According to literature review about intra-port competition, the benefit of intra-port competition are namely: preventing port service providers to abuse its market power and lead to specialization, flexible adaptation and innovation. Those benefits surely can be used as triggers that will improve the quality of terminal operators in Tanjung Perak port. The quality of terminal operators is important factor of port selection. Therefore, Tanjung Perak port can improve its container throughput market share by unleashing intra-port competition within its container terminals.
7 Conclusions and recommendations

After detailed analysis in previous chapters, then this chapter will summarise all the major findings and arguments in order to see if they can answer all of research questions as stated in chapter one. Subsequently, this chapter will also provide some foods for thought as recommendations to future researches.

7.1 Conclusions

The amount of container throughput at Tanjung Perak port has been increasing each year due to economic growth in Indonesia. However, the container throughput growth was unable to increase the container throughput market share at Tanjung Perak port, apparently the market share has been decreasing continuously since 2009. Market share development is important to gain more economies of scale and market power. If the market share of Tanjung Perak Port in container sector successfully increases, IPC III as a main terminal operator in Tanjung Perak port will obtain more profit from containers handling activities. Furthermore, the economy in East Java region will be successfully improved. Therefore, it needs a strategic solution to overcome the downward of Tanjung Perak container throughput market share.

In order to obtain a possible solution for this research problem, hence three research questions are needed to be answered. Indeed, before answering the questions, this thesis started with the literature review and the analysis of container market. According to literature review, market share improvement can be done by capturing the rival’s market share. The market share of port comes from the hinterland around maritime range, so the port can either convert the contestable hinterland to become captive hinterland or expand the contestable hinterland into rival’s captive hinterland in order to improve the market share of port. The analysis has also identified the importance of intra-port competition and ports relationship. Intra-port competition is appropriate to enhance innovation and specialization that make port and its terminal operators become more competitive. In addition, ports relationship should be appropriately balanced not too low or not too high in multi-dimensional of proximity, otherwise it will hamper the innovation toward ports.

Next, according to the analysis of container market, the demand for container terminals in Java range will remain high. Port of Tanjung Perak and Port of Tanjung Emas are more ready to receive increasing containers throughput in their terminals, but Port of Tanjung Priok seems falling behind in capacity expansion to catch up with the increasing container throughput in the next few years. It is an opportunity
for Port of Tanjung Perak and Port of Tanjung Emas to attract container flows from Tanjung Priok Port that struggles with congestion and capacity.

Through the three sections of analysis of port competition, the analysis did answer the research question about the key opportunities of Tanjung Perak port that can be identified to improve competitiveness of Tanjung Perak port. First, 5 forces analysis has revealed that the improvement of hinterland infrastructure has paved the way for Tanjung Perak port to penetrate its market into competitor’s hinterland. Furthermore, Tanjung Perak port has an opportunity to become transport hub for international containers if Toll Laut is successfully implemented. Second, Inter-port competition analysis indicates that IPC III can lead the port entrepreneurship in order to gain more port’s market share. Inter-port competition analysis also revealed a potential coopetition relationship within Tanjung Perak port and Tanjung Emas port as both ports have a close institutional and organisational proximity. Third, Intra-port competition analysis shows the low level of competition, therefore it is an opportunity to improve container throughput by creating fiercer intra-port competition among container terminals in Tanjung Perak port.

Next, attempts to answer the research question about factors of port selection have been completed. This is essential to find the dominant factors which port users at Java consider when choosing which port as the destination for loading or discharging their container. The strongest factor is geographical proximity, the inefficient of transport system is considered as the main cause of the port user’s decision to prefer a closer port. The second factor is information service in port, this shows the importance of cognitive proximity among port actors to serve a better information service for the customers. And the third factor is quality of terminal operator, from the literature review indicates that lack of intra-port competition could undermine the terminals competitiveness.

Based on all above analysis, this thesis come up with three strategies that can be suggested to increase the containers throughput in Tanjung Perak port and at the bottom end will increase the market share of containers among ports in Java range. Those three strategies namely:

- Coopetition with Tanjung Emas port

Comparative analysis indicates the collaboration with a partner that has geographical proximity is potential to gain throughput market share and market power. Tanjung Perak port and Tanjung Emas port hold potential to improve their container throughput market share over coopetition between these ports. Creating a coopetition relationship can be done by collaborating on infrastructure, transportation synergy, research and development, regional marketing, and so on.
• Railway integration

Congestion on road transport in Java has led logistic costs to become more expensive and more unreliable. Hence, shippers choose geographical proximity as the most important factor of port selection. Tanjung Perak port has been struggling to expand its captive and contestable hinterlands. Therefore, the solution that is most suggested is the improvement of railway transport share. For this purpose, IPC III can initiate a collaboration with PT KAI in developing railway network within port area and creating dry ports in hinterland area.

• Unleash intra-port competition.

According to literature review about intra-port competition, the benefit of intra-port competition are namely: preventing port service providers to abuse its market power and lead to specialization, flexible adaptation and innovation. Those benefits surely can be used as triggers that will improve the quality of terminal operators in Tanjung Perak port. The quality of terminal operators is important factor of port selection. Therefore, Tanjung Perak port can improve its container throughput market share by unleashing intra-port competition within its container terminals.

Those strategies are recommendations for Tanjung Perak Port to regain its container throughput market share in Java region. If the market share is successfully increased, IPC III as a main terminal operator in Tanjung Perak port will obtain more profit from containers handling activities. Furthermore, the economy in East Java region will be successfully improved.

7.2 Recommendations

A few questions arising related to port competition and container market share in Tanjung Perak port require further study. Before ending this thesis, these following questions have been recommended for further researches:

1) This thesis has been covering the Java container industry during the period 2009-2014. In January 2015, the Indonesian government launched the Tol Laut concept that will change the shipping network. Therefore, it is recommended to conduct a research again after the implementation of the concept.

2) In this thesis, the roles of minor ports (e.g. Cilacap, Gresik, Banten, etc.) are not considered. How are the future prospects of these ports in Java container market? And is there any project for developing new ports from green field area that will disrupt the market share of Tanjung Perak port?
3) One of the strategy suggested in this thesis is cooperation between Tanjung Perak port and Tanjung Emas port. How to create a synergy for those ports without diminishing the degree of competition?

4) Last but not least, this thesis has identified the horizontal integration of IPC III towards container terminals in Tanjung perak port. Will it be possible to create inter-port competition without introducing new terminal operator? For example, will it possible for IPC III to sign an agreement not to interfere the operational sector of TPS, TTL and BJT?

In order to analyse these questions, the researchers can use this thesis as a platform to conduct further studies and make significant contributions to the development of port and container terminal.
Bibliography


Langen, P. d. (2007). Port competition and selection in contestable hinterlands; the case of Austria. *EJTIR, 7, no.1.*


Appendix 1

Domestic container ship routes through Java

Source: www.meratusline.com
Appendix 2

International container ship routes through Java

1. Maersk Line

- Vostochniy
- Busan
- Kwangyang
- Shanghai
- Xiamen
- Keelung
- Hong Kong
- Jakarta
- Surabaya
- Tanjung Pelepas
- Singapore
- Jakarta
2. NYK Line
3. EVERGREEN

Source: www.evergreen-line.com
4. CMA-CGM

Source: www.cma-cgm.com
Appendix 3

LAYOUT OF THE SURVEY QUESTIONNAIRE

Welcome to the survey about factors of port choice

In pursuant to a thesis research in Netherlands Maritime University with the title "Strategy for Improving the Market Share of Tanjung Perak Port in Container Sector: A Study on Port Competition Perspective", hereby I request for your precious time in order to participate in this survey. The aim of this survey is to discover the determining factors of the shipper and forwarder to choose a port as a loading/discharging place for containers in Java.

The survey should only take 10 minutes of your precious time, and your response will completely anonymous.

If you have any questions about the survey, please email me: mail@daddysumartono.com

I really appreciated for your input! Thank you for participating in my survey. Your feedback is very important.

Regards

1. Firm’s name

2. Address

3. Business sector/ function related container delivery

<table>
<thead>
<tr>
<th>Forwarder</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Shipper</td>
<td></td>
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<tr>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>
4. Your reasons for selecting current port? (as a destination of loading/discharging of container in Java)

<table>
<thead>
<tr>
<th>Reason</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency and quality shipping services</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality terminal operating companies</td>
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<tr>
<td>Quality of equipment</td>
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<tr>
<td>Quality connections to hinterland services</td>
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<tr>
<td>Location of port</td>
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<tr>
<td>Faster customs clearance</td>
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<tr>
<td>Information services in port</td>
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<tr>
<td>Customer focus in port</td>
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<tr>
<td>Good reputation related to delay and damage</td>
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<tr>
<td>Personal contact in port</td>
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</tbody>
</table>

5. What factors that you will consider to shift to a more expensive port?

<table>
<thead>
<tr>
<th>Reason</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location of port is closer</td>
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<tr>
<td>Better efficiency of port</td>
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<tr>
<td>Better frequency and quality of shipping services</td>
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<tr>
<td>Quality of connection to hinterland services</td>
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<tr>
<td>Port more focus to Customer</td>
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<tr>
<td>Port Feature</td>
<td>Strongly Disagree</td>
<td>Disagree</td>
<td>Neutral</td>
<td>Agree</td>
<td>Strongly Agree</td>
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<tr>
<td>Better port’s information system services</td>
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<tr>
<td>Availability of connection to hinterland services</td>
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<td>Lower Risk of delay</td>
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<tr>
<td>Better personal relationship with port</td>
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<tr>
<td>Faster customs clearance</td>
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<tr>
<td>Sophisticated and environmental friendly equipment of port</td>
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</table>

### 6. Response a number of port preposition

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port choice is based on historical reasons/tradition</td>
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<tr>
<td>Port choice is based on personal relation in port</td>
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<tr>
<td>Port choice is based on (perception of) price</td>
<td></td>
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</tr>
<tr>
<td>Port choice is based on (perception of) quality of port</td>
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<tr>
<td>Total port costs are important but not decisive in port selection</td>
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<tr>
<td>Quality and service determine port choice, as long as the price does not exceed a certain level our company is willing to pay</td>
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<tr>
<td>A lower price can compensate a lower service level</td>
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<tr>
<td>When more ports offer an attractive price/quality, cargo is distributed over</td>
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<tr>
<td>various port</td>
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<tr>
<td>Port choice is continuously re-assessed</td>
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<tr>
<td>If our current port provides satisfactory services, there is no reason to change ports, even if price advantages exist</td>
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</tbody>
</table>