DRY-PORT DEVELOPMENT TO SUPPORT DISTRIBUTION CHAINS OF EXPORT-IMPORT COMMODITIES IN INDONESIA

Johannes Anwar - Sutanto Soehodno

ABSTRACT

This research discusses on study undertaken for improving the distribution chains of export-import commodities in Indonesia. As for capacity, the existing Tanjung Priok port has reached its crucial capacity to serve such commodities whilst surrounding land-use has already been dense with city developments, it seems impossible to increase its capacity. Two possibilities stand for such capacity improvement are to develop other port at different point or to develop dry-port away but closer to industrial estate as focal point. A study for the latter, therefore, is undertaken to figure out the feasibility. Lemah Abang - Bekasi, an area of neighboring city of Jakarta, as proposed focal point is analyzed as spot of dry-port. This area is within the industrial estates whereas upstream of export-import commodity flows. This study conducts a market research comprising of three steps of following analyses, namely: analysis of existing or identified problems, formulation of export-import model for its projection and market perception on proposed dry-port development, and analysis of various aspects related to dry-port development, especially related to price sensitivity, comparative and competitive advantages, as well as sound transportation. In conclusion, study has revealed, through sequences of analyses, that dry-port development at Lemah Abang has competitive and advantageous values in supporting Tanjung Priok port in export-import commodities handling.

Keywords: dry-port, export-import commodities, comparative/competitive advantages, sound transportation.

Johannes Anwar

Center for Transport Studies
Department of Civil Engineering
University of Indonesia
UI Campus, Depok
Jawa Barat, Indonesia
Fax: +62-21-786-3447

Sutanto Soehodho

Professor of Transportation
Center for Transport Studies
Department of Civil Engineering
University of Indonesia
UI Campus, Depok
Jawa Barat, Indonesia
Fax: +62-21-786-3447
E-mail: tanto@eng.ui.ac.id

I. BACKGROUND

The Indonesian export data of 2009 (Statistic Bureau ; 2010) shows that total export value is reaching of US$ 116,510 million with export volume of 378,999,100 tons. The data shows trends of average 9.5% increment on the export value with 7.0% export volume increase within the same period. The trend leads to projection of continuous increase of Indonesian export in the future. Therefore it needs efficiency and effectiveness improvement of all influencing factors to the Indonesian export capacity. One of the factors is logistics, namely qualified logistics system and distribution port is needed to support national export/import.

From several main export import ports in Indonesia, Tanjung Priok is the busiest port in Indonesia. Statistic Bureau also reveals that this port serves about 24.54% of all total national export value and 41.49% of total import value. In 2009, total container serving for export/import was 2,583,492 TEUs (twenty feet equivalent units). Predicted problems to arise as increasing trends of the export-import volume in the future within limited space of port facilities is that the Tanjung Priok port can not keep up with the increasing demand of shipment including container services.

Table 1.
Export Value and Volume of Indonesia (Year 2000 to 2009)

Year	Export Value FOB (million US$)	Export Volume FOB (000 tons)	Growth of Export Value (%)	Growth of Export Volume (%)
2000	62,124	225,103	-	-
2001	56,321	272,457	-9.3%	21.0%
2002	57,159	223,270	1.5%	-18.1%
2003	61,058	219,567	6.8%	-1.7%
2004	71,585	232,317	17.2%	5.8%
2005	85,660	258,731	19.7%	11.4%
2006	100,799	327,172	17.7%	26.5%
2007	114,101	342,773	13.2%	4.8%
2008	137,020	355,053	20.2%	3.8%
2009	116,510	378,999	-15.3%	6.5%
Average			**9.5%**	**7.0%**

Source: Statistic Bureau (2010)

Meanwhile from its hinterland, Tanjung Priok services covering Banten, DKI Jakarta, West Java until Central Java. Data of the year 2009 presents that these 12 industrial estates in West Java contributed more than 62% of total TEUs served by Tanjung Priok. High volume of container from the industrial estate in West Java causes heavy traffics in existing road infrastructures. This is due to insufficient condition of the road and further worsened by badly damaged road because of the high frequency of overload vehicles passing while the road is not designed with proper standard. Should this condition remain several years to come, the traffic will surely get worse for road expansion does not match to traffic volume growth. It takes actual action to anticipate this condition

by using more efficient alternative transportation mode like railway.

As of the export condition, the Indonesian import is surely in needs of adequate infrastructure. The economic activities growth also show increasing trends of national import volume, especially post economic crisis. Data of the year 2000 to 2009 shows average of 14.57% increase. Within this period, the biggest composition of import is 77% raw material; others are capital and consumption goods. Raw material import is very important for production input. Hypothesis made here is that raw materials imported go to industrial estate using the same path with export but in a different direction. This fact is surely strengthened by the needs of improving existing transportation system.

Other problem arising in the national export-import activities is the existence of many illegal contribution payments done by legal or non legal institution for the national logistic forwarding which result in high-cost economy. The University of Indonesia and the Asia Foundation listed on legal and illegal charge as of retribution payment 46%, truck weighing station 32%, and security charge/street kids of 22%. This research also calculates average operational cargo cost in Indonesia reaching the amount of Rp.3,093/km or USD34 cent/km. It is above average in Asia, which is only of USD22 cent/km. Both institutions also conclude that logistic cost in Indonesia is reaching 14% of total production cost, while Japan is only 4%, wherein this cost structure shows that Indonesia is very inefficient in logistic sectors.

Table 2
Import Value of Indonesia (Year 2000 to 2009)

Year	Raw material Import Value (million US$)	Total Import Value (million US$)	Growth of National Import (%)	Import Value of Tanjung Priok (million US$)
2000	26,018.7	33,514.8	–	15,637.2
2001	23,879.4	30,962.1	-7.61%	14,653.4
2002	24,227.5	31,288.9	1.05%	14,763.7
2003	25,496.3	32,550.6	4.03%	14,668.4
2004	36,204.2	46,524.5	42.93%	22,141.2
2005	44,792.0	57,700.9	24.02%	24,226.5
2006	47,171.4	61,065.5	5.83%	24,267.4
2007	56,484.9	74,473.6	21.96%	30,899.0
2008	93,022.8	98,664.0	64.7%	54,384.0
2009	69,717.5	91,354.2	-25.1%	40,826.0
Average			**14.57%**	

Source: Statistic Bureau (2010)

Meanwhile World Bank survey (2003) shows three obstacles in Indonesian trading, like many documents to submit, long document processing time and high cost of each export-import activities. The World Bank also reveals that problems in logistic cargo and inefficiency of infrastructure are the main problems in Indonesia export/import activities. World Bank notes several documents needed in national export import activities like port

documents, custom clearance, bank clearance, and legal documents of related parties. The research concludes that legal document settlement is in a very close relation to charges. Latest research done by the World Bank and The Asian Foundation listed the documents charges, administrative cost for custom and technical survey, terminal handling charges as total export import charges. Both institutions conclude that government with efficient custom system, good transportation network, and less paper work on export/import procedures will result in a fast and cheaper export/import procedure which is globally competitive.

From this existing condition, this research foresees dry-port container building to increase the national logistic capability. By this facility, it is expected that every documentation processing can be done in the industrial estate. Besides, the World Bank also recommended National Single Window (NSW) which is already implemented in Tanjung Priok Port by the end of 2007 as one stop services of export/import.

2. EXISTING CONDITIONS

2.1 Indonesia and Tanjung Priok Export Import and Growth of Investment

In 2000, Indonesia export value in Tanjung Priok port is only US$ 18.8 billion. However, it increases more than 50% into US$ 28,0 billion in 2009 (Figure 1). Export rate growth within those periods is 9% per year. However, from export weight side, there is negative growth within those period that is decreasing of 2.5 million tons. Weight import percentage to total international trading in Tanjung Priok Port is reaching 58%. Different from Indonesia import performance, import performance in Tanjung Priok port shows constant growth of average 3% per year, starting from 18,9 million tons (2000) to 24,2 millions tons (2007).

Export index as critical indicator in international trading shows a positive growth. Generally, within the period of 2000-2007, there was significant growth of 9.5% per year. On the other hand, intervention by Bank of Indonesia since the economic crisis in 1998 brought achievement of rupiah exchange rate
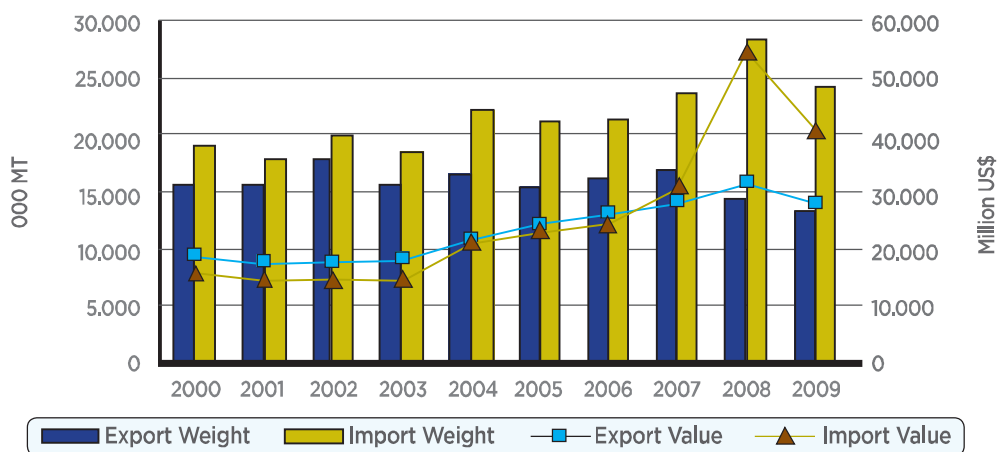

Figure 1
International Trading of Indonesia in Tanjung Priok

to US$ grown to 2% per year.

In fact since 2006, Bank of Indonesia exchange rate remained between Rp 9,000-9,200 per US$. This phenomena shows that increasing export rate in rupiah is not because of the Rupiah falls towards US$ as it was in 1998, but more because of the real export trading performance improvement. Indonesia import rate tends to follow the rupiah movement towards US$. Import rate index shows positive improvement from years.

Jabotabek is the critical area for Java island economic. Foreign Capital Investment (PMA) contribution of Jabotabek area is far bigger even to all West Java area. Within the period of 1999-2000, PMA proportion of Jabotabek, West Java and Indonesia (remaining areas) are consecutively of 21%, 10%, and 69%. This also apply for number of approved PMA, 45% in Jabotabek area, while West Java is only 15%, and 40% spreading in other area in Indonesia. This fact shows that Jabotabek area has special attraction for foreign investment, especially for on agricultural or manufacture, considering limited space

available in the area. Investment license issued by Invesment Board for foreign investment in this area is reaching the amount of 721 investments in 2009, while in 1999 is only 429. Number of foreign investment approved grows into 9% per year. On the other hand, licensing issued in 2009 value more than US$ 5 billion, significantly increase from the 1999 of US$ 0.8 billion only (Figure 2). The dropping investment of 1999 project was an impact of economic crisis in 1997/1998.

Unlike foreign investment, domestic investment in Jabotabek area is growing 5 % only, comparing to West Java area which reaching around 11 %. However, from the amount point of view, there was no significant difference although number of Jabotabek domestic investment is higher than West Java area. The growth of domestic investment is 4 % each year. On the other hand, license issued in 2009 valued more than Rp 5.6 trillion, significantly increased from 1999 of Rp 1.3 trillion only. Dropping domestic investment project value in 1999 was also an impact of the economic crisis in 1997/1998.
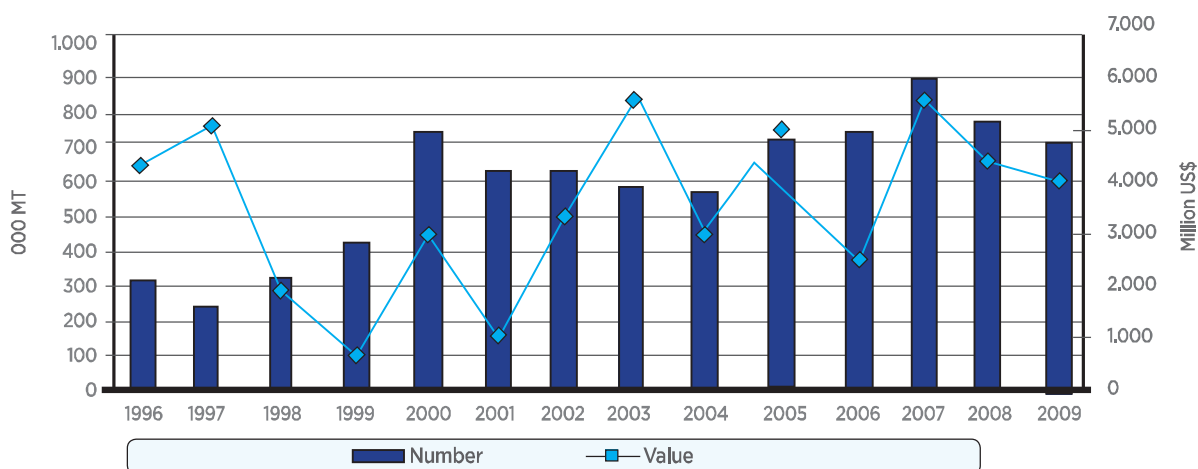

Figure 2
Foreign Investment in Jabotabek Area of 1996-2009

2.2 Bekasi and Karawang Industrial Estate Profile

Bekasi and Karawang are two districts in West Java with competitive industrial manufacturing sector in Indonesia. From the investment view, international and domestic investor sees both districts as the best destination of manufacture. Today, there are 7 (seven) industrial estates in Bekasi and 5 (five) in Karawang categorizing into big scale industrial estates beside other smaller estates. Export value from these industrial estates of both residences reaching of US$ 17.3 billion. Manpower utilizing is reaching more than 650,000 people for industrial sector only, aside manpower in other sectors. Total tax income in 2008 reaching of Rp.14 Trillion with potential of reaching Rp. 40 Trillion in 2020 assuming should the economic growth rate is following today's trends. Contribution to regional economic growth is 7.42%, higher than national growth of only 5.8%. Complete locations of the industrial estates in Bekasi and Karawang show in Figure 3.
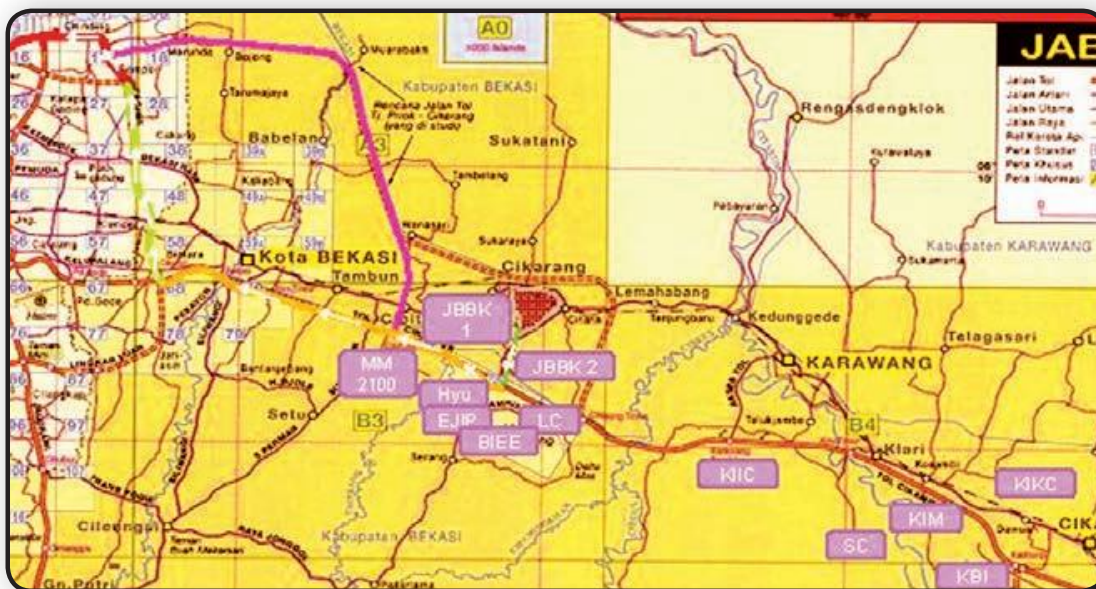

Figure 3
Industrial Estates Location in Bekasi and Karawang

2.2 Existing Road and Container Transportation from Bekasi and Karawang

Basically, all roads in Jabodetabek are heavily traffics, especially access road to port and industrial area. The traffic will get worse during peak hours, especially in roads where goods and non goods transportation meet. For this study, performance of the roads to analyze and measure is the connecting roads to Tanjung Priok port in the industrial estate in Bekasi and Tangerang. Temporary result of the secondary survey covers that forwarding performance by toll from and to Tanjung Priok port is no longer adequate under the following reasons:

- Cawang interchange is over capacity
- Cawang – Tanjung Priok toll is over capacity, during peak hours in the morning and afternoon (average speed is 15 km/hr).
- Toll capacity from Cikarang to

Cawang is inadequate, many delay should there be any accident or car broken.

Meanwhile, the arterial road, as the main alternative for transportation to and from Tanjung Priok port is of the same condition with toll, which cannot cover the high volume of cars. Condition resulted from monitoring and secondary survey is as follows:

- Cakung-Cilincing artery is heavy traffic and many blockage in its sides
- No link road amongst the industrial estate
- Inadequate road and crossroads capacity along Cikarang – Cibarusah road
- Traffic volume at Jababeka intersection toll access, in the morning of 2,074 veh/hr (VC ratio 0.96) and 1,572 smp/hr (VC ratio 0.73) in the afternoon.

Meanwhile, as the busiest port in Indonesia, Tanjung Priok Port served large number of goods and passenger in the one port location. In 2007, Tanjung Priok served more than 3.7 million TEUs container, which is 2.65 million TEUs of it is export import container, and the rest is inter island container. More than 60% export import containers originated from or sent to industrial estate in Bekasi and Karawang. Regarding goods flows from and to industrial estate and Tanjung Priok port since 2004 to 2007, there is a trend of increment despite the falls in 2005, it increased in 2006 and 2007. Particulary for Bekasi and Karawang industrial estate, it is estimated to send to 1,700 TEUs export container and receiving of 2,600 TEUs import container per day.

Table 3
Container Contribution of Export-Import of Bekasi and Karawang (TEUs)

Year	Export Contribution of Industrial Estate in (TEUs)	Import Contribution of Industrial Estate in (TEUs)*
2004	488,647	952,794
2005	563,696	841,241
2006	580,370	904,234
2007	625,239	1,027,285
2008	533,918	1,236,552
2009	492,716	1,053,225

Source: Pelindo II

3. Methodology and Model Development

As indicated in literatures several researches had identified problems and obstacles on Indonesia export development, in which one of them is inefficient logistic cargo. Regarding export development and national product competitiveness in international market, government has issued inter-sector policy package as an incentive and easiness for exporter and importer. The policy includes tax-incentive, simplicity on licensing and bureaucracy and providing quality infrastructure for best export-import servicing. Until now most export import activities are sea freight utilizing ocean and pioneering port in Indonesia although latest information reveals arising amount of export and import quantities through air freight.

The implementation of the policy package for infrastructure sector is providing and developing infrastructures which support production and distribution processing of national export import commodities. Identification on export barrier shows serious problems in internal distribution from central production to port which deteriorates national commodity competitiveness. In relation, especially in shipment, a modern port needs to be developed wherein at the same time it may improve comprehensive system for national export commodities to be more competitive.

3.1 International Trading Overview

In macroscopic view, container service is part of Indonesia economic condition and trading activities. This chapter will detail explaining the international trading review, export-import procedures and illustration of national export-import growth and national and local investment growth.

International trading is simply defined as delivery of goods, service and capital from one country to another. The origin country called exporter, while destination country is importer. The trading activities perform under both countries and international regulation. Export-import was initially done to fulfill the needs of goods which is not produced by one country but made by others. Today, international trading is not only for that reason. Adam Smith idea was, by free trading, every country can specialized their products with absolute quality (efficiently produced than others) and importing goods of their lack (inefficiently produced). Smith theory on absolute profit is correct, but it explains a small part of the international trading only. David Ricardo explained that in spite of the production lack of a country, profitable trading can still take place. A country can specialize production as its comparative strength. Comparative strength is the ability to produce low cost of goods comparing to other country. Many factors effect a country's international trading. Mostly are policy implemented to protect domestic economic needs. Some of the factors are exchange rate, tariff regulation, type of goods, subsidize, investment, economic condition.
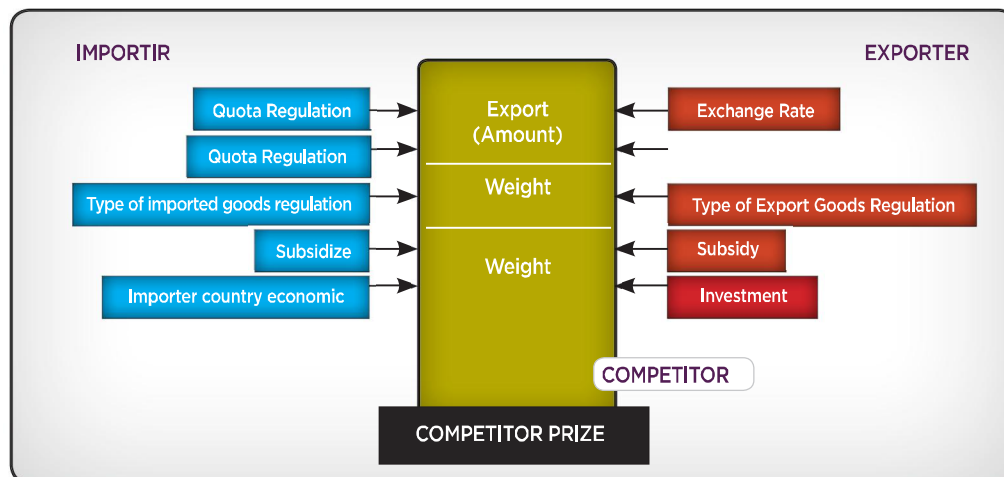
Figure 4
Basic Model of Import Export

3.2 Analysis for Market Size Measurement

There are two approach methods used in this study to measure market potential of dry port container, i.e descriptive analysis and multiple regression analysis. Descriptive analysis method is to get a description of the user and terminal operator perception on existing condition and their interest on dry port building and using. Meanwhile multiple regressionanalysis is to find out effecting factors to national export and industrial estate, especially Tanjung Priok. Main objective of this analysis is to measure export projection for market size measurement on the dry port plan. The ensuing sub-sections are analysis used in this research.

1. Validity Test

Validity is a measurement showing validity level of an instrument. An instrument is valid when it can measure what is needed and can get precise data from the variable tested. To measure validity of instrument, a test should be executed. The test is using moment product correlation technique as follows:

$$r = \frac{n\sum XY - [(\sum x)(\sum Y)]}{\sqrt{[\sum X^2 - (\sum x)^2][\sum Y^2 - (\sum Y)^2]}} \quad (1)$$

Where as:
r = product moment correlation
Y = dependent variable
X = independent variable
n = number of sample

2. Reliability Test

Ebel and Frisbie (1991) said that an instrument is reliable when it can measure symptoms at a different time with the same result, reliability also a prerequisite for research validity. Should an instrument is unreliable, it surely not valid, because reliability is an index which shows how reliable a measurement is. Therefore, reliability

relates with measurement instrument accuracy. To test level of reliability Standardized Item Alpha formula can be used:

$$\delta std = \frac{\overline{kr}}{1+(k-1)\overline{r}}$$

Where as:

δstd = instrument reliability
$\overline{r}$ = average correlation
K = number of questions

Acquiring δstd value, then compare it to reliability critic in Alpha table, a table which shows relation between number of questions and reliability instrument.

3.1 Descriptive Statistics

Descriptive statistics useful for population description, base on sample taken from the population.

4.1 Econometric Analysis

Multiple regression analysis is used to study or understanding how some independent variables influencing dependent variables in a phenomena. Multiple regression analysis is a statistic model used to find out how big is the impact of an independent variables to dependent variable. This technique describes dependent variable connected to one or more independent variables. Then it is explained that multiple regression coefficient in an equation measuring changing of dependent variables related to independent changing with the assumption that other independent variable constant. Multiple regression model:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon \qquad (3)$$

Where as:

Y = Export/import volume or value
α = constant
βi = independent variable regression coefficient –i
Xi = hypothesis independent variable impacting export/import like exchange rate, tariff, tax, incentives, etc.

Further Test F and t Test used to see impact of variable and coefficient. Test F used to see the impact of independent variable on dependent variable. Meanwhile t Test is to test partial regression coefficient or to know each independent variable impact on dependent variable. This t test can also used to know which independent variable is most dominantly influencing dependent variable.

Normality test was used to examine the model residual whether has normal distribution or not. The good model must have normal distribution or close to normal distribution. Testing is done with Kolmogorov-Smirnov normality test. Elasticity is used to evaluate impact of every factor in model to dependent variable. Elasticity is defined as percentage of changing in dependent variable that caused by 1% changing in independent variable.

4. ANALYSIS

4.1 User and Operator Perception on Dry Port

Direct interview survey with stakeholders of container service is necessary to get uncovered information of secondary data collection, this is the main part of this study. Industrial in Bekasi District and Karawang District was selected as respondent, based on consideration that they are as potential user of dry port. Terminal operator or shipping expedition (EMKL) is the container server respondent. Survey method is direct interviewing respondent with authority to policies related with container services. Number of sample for producer or industrial owner are 120, where as net sample is 100.

Survey result on exporter in Bekasi and Karawang shows that half of the exporter said that transportation fee is still expensive. However, 60 % of them claim that document fee is inexpensive (Table 4). One stop station applied by the government shows real result that 80% export and import companies said that document processing time is fast. While related to time delivery from the fabric to Tanjung Priok port, 60 % said it is fast.

Table 4
Charges Perception

Perception	Perception Rate (%)	
	Expensive	Cheap
Transportation fee	49	51
Document processing fee	40	60

Source: Data Processed

Table 5
Time Length Needed for Delivery and Export Document Processing

Perception	Perception Rate (%)	
	Fast	Slow
Time needed to deliver goods from fabric to port	60	40
Time needed for document processing	80	20

Source: Data Processed

However, exporters and importers are still complaining on extra illegal charges on export processing starting from the fabric to Tanjung Priok port. The biggest percentage perception on this charge is around the container yard/terminal that is 29%. It is also happening on delivery through terminal, of 26 %. Even in truck weighing station of 14% only. By dry port building, it is expected to alleviate extra charges so that it will not burden export or import charges. Security level during delivery processing from fabric to container yard shows that exporter

feel safe with existing condition. Survey shows that exporter feel secure for their goods placed in container yard during the process. Generally, exporters still find difficulty from delivery to shipping (23%). However, almost all exporters said there is no critical problem in the processing with forwarder. This shows that forwarder has trying their best to overcome all obstacles in export and import document processing although in reality problems arising on delivery to shipment (Table 6).

Table 6
Perception on Problem Facing by Exporter and Importer

Perception	Perception Rate (%)	
	Always	Rarely
Problems on processing with forwarder	9	91
Problems on delivery from fabric to shipment	23	77

Source: Data Processed

Survey shows that around 76% exporter companies are willing to become dry port stakeholders. From the export weight and value, company who refuse to be stakeholders can only achieve 2 % of weight and 15 % export value (Table 7).

Table 7
Export Company Willingness to be Dry Port Stakeholders

Survey Recapitulation	Yes	No
Percentage of number of company	98	2
Percentage of value of export/import	85	15
Percentage of export-import	76	24
Percentage TEUs	76	24

Source: Data Processed

Generally, there is a consistency of opinion from the export companies who are willing to be dry port stakeholder and those who are not willing to. (Table 5.11). Timely processing of document, travel dispensation, and easiness of truck weight station needs special attention in export processing. This shows that the three aspects are quite slowing down the export processing.

What a quite interesting thing is that document processing quality improvement without significant cost increment or decrement is not of the exporter interest, that it goes to last priority. This shows that existing quality is quite satisfying, meet their expectation. Other factor which is considered good is that the fact of not many extra illegal charge applied in the export processing is not under the concern of exporters. This factor equals to security guarantee from fabric to port (Table 8).

Table 8
Average Priority Rank for Export Import Performance Improvement
Base on The Willingness to Become Stakeholder

Aspect	Average Rank		
	Agree	Disagree	Total
Speed and ease in custom clearance processing	4	3	3
Speed and ease in travel exception	5	5	5
Speed and ease of truck weighing station processing	5	6	5
Goods saving in port of not more than 1 day	5	6	6
Speed and ease on cargo processing	6	6	6
Speed and ease of export import tax processing	6	6	6
Integrated system in one stop service	7	6	6
No illegal charges	7	6	7
Security of goods from fabric to port	8	7	7
Online system on custom clearance	8	9	8
Improved quality of document service with no extra charges	9	8	9
Significant cost decrement for existing service quality	10	10	10

Source: Data Processed

4.2. Model Result

Foreign trade model projection is carried out to detect behavior of international trade phenomena i.e export and import volume and value, for Indonesia and Tanjung Priok port as well. As indicator of export performance, a production model is also made to see export and import development. Generally export volume is influenced by some factors such as production, price index of big export products, exchange rate, interest rate, and average cumulative value of Jakarta domestic investment rate.

Analysis report shows that the export volume does not quickly follow production development. In general, 1% production increase in a short period of time on the related month will raise export about 0.60%. Nevertheless, additional production of 10 months ago will also influence export volume. Total production influences in the long term if national production increases by 1% it will increase of 1.03% Tanjung Priok port export. From the Indonesia macroeconomic development side, interest rate and exchange rate influence much to export performance of Tanjung Priok. Depreciation 10% rupiah against US$ in 4 months ago will increase expert performance 8.2% (in short term) or about 9.4% in the long term.

Although interest rate is contribute to export performance, but it is not responsive enough. An increasing of 1% interest rate is only lower the export performance by 0.20%. In the long term, the influence increasing of 1% interest rate increase will only cause a decrease of 0.22 % in the export performance. The average value of PMDN investment in Jabotabek provides quite significant raise to the port export performance. Every additional capital of PMDN in Jabotabek in average of 1% around 3 months ago will increase export performance by 1.82%. The impact of 1% raise in Jabotabek PMDN capital will increase export performance by 2.08%. The result of the export value analysis of Tanjung Priok Port is shown in Table 9.

Table 9
Tanjung Priok Export Volume Analysis

Dependent Variable	Coefficient	Pr > | t |	Short Term Elasticity	Long Term Elasticity	
	- 3071526081				
Intercept	1	0.0113			
Production_ Index	7152017	0.0042	0.60	0.68	
Lag10 (Indeks_Produksi)	3784359	0.0904	0.31	0.35	
Lag3 (IH_export)	-2204685	0.0460	-0.19	-0.21	
Lag4 (Kurs)	121092	0.0007	0.82	0.94	
Lag2 (BI_Interest_rate)	-11150574	0.0647	-0.12	-0.13	
Lag 10 (BI_Interest_rate)	-6187226	0.1308	-0.08	-0.09	
Lag 3 (Avg_Dom. Inv_Jabotabek)	21230810	0.0113	1.82	2.08	R2 = 23.00%
Lag3 (Priok_Export_Volume)	0.12195	0.1871	-	-	DW = 1.99

Source: Data Processed

Table 10
Tanjung Priok Export Value Analysis

Dependent Variable	Coefficient	Pr > | t |	Short Term Elasticity	Long Term Elasticity	
Intercept	-561956202	0.0003	---	---	
Priok Export Volume	0.33244	0.0002	0.26	0.47	
Non Oil&Gas Price Index Export	9881659	<.0001	0.63	1.13	R2 = 80.59%
Lag (Priok Export Value)	0.44745	<.0001	---	---	DW = 2.157

Source: Data Processed

Result of the analysis shows that the Tanjung Priok Port monthly export value is very much influenced by export volume and value. Every 1% increase in export volume will raise export value about 1.26%. In long term, every 1% increase in export volume will raise export value of 0.47%. Also for the export price index raised which represents export price of 0.63%. In the long term, 1% increment of export price will be elastically responded by about 1.13 export value. As for import performance, base on the result of the Tanjung Priok port import volume performance is shown on Table 12. The analysis result shows that 1% increase of large and medium scale industry production in 1 semester ago is expected to lower import of about 0.92%. In the long term, 1% increase in domestic production will lower import performance of 1.5%. Every increase of import commodity price will decreasing import by 0.73%. If this continuously happens, in the long term it may cause decrease in import about 1.2%.

Table 11
Tanjung Priok Export Volume Analysis

Dependent Variable	Coefficient	Pr > | t |	Short Term Elasticity	Long Term Elasticity	
Intercept	-798547629	0.3692	---	---	
Lag 6 (Production_Index)	-8933088	0.0083	-0.59	-0.96	
Lag 7 (Production _ Index)	-4979850	0.145	-0.33	-0.54	
Import_PI	-10680490	<.0001	-0.73	-1.20	
Lag 9 (Avg_Dom. Inv Jabotabek)	28767688	0.0002	2.00	3.27	
Lag 8 (BI_Interest_rate)	-9720515	0.0197	-0.10	-0.16	
Lag (Priok Import Volume)	0.38889	<.0001	---	---	
Lag 2(Priok Import Volume)	0.14036	0.0976	---	---	DW = 1.639
Cumulative Number	-6187226	0.1308	-0.08	-0.09	

Source: Data Processed

An increase in capital investment realization, both Foreign Capital Investment as well as Domestic Capital Investment in Jabotabek area will increase the import volume and value in Tanjung Priok port more. Domestic investment response rate is predicted higher than PMA. Each 1% increase of PMA in Jabotabek area or equals to the increase of 30 PMA companies will raise import volume about 0.7%. In the long term, the existence of these PMA will response to the increase of import about 1.15%. It is also the case with average of 1% increase in domestic investment will cause 2% monthly increment of import performance. It will even increase export performance of around 3.27% per month. With a condition of about 8 - 9% interest rate, it seems that 1% increase of interest rate does not influence import performance much. However increment of interest rate still gives negative impact to Indonesian import growth as well as Tanjung Priok port. Analysis of import values in Tanjung Priok port is given in Table 12.

Analysis report shows that monthly import value of Tanjung Priok port per month is very much influenced by export volume and price. Every increasing 1% of export value then will raise export value 0.24%. In the long term, for each 1% increment of export value will increase of about 0.38% export value. It is also the case with the increment of first and third lag of import price index which represents the import price. For each 1% increase of import price first lag will raise import value of about 0.17 %. In the long term, an increase of 1% of import price will be responded by 0.26% export value.

Three scenarios projection of the year 2020 are: pessimistic, ceteris paribus and optimistic. Instrument indicators used in this simulation are import index, production index, BI interest rate, Jakarta foreign investment cumulative, average Jakarta domestic investment. On pessimistic scenario it is assumed that the movement of the Rp currency rate will increase by 1.5% per

year; export price increment of 10% ; non oil export and import price of 9% each; production grows only 1%;   interest rate   will   only grow by 3% per year; PMA accumulation will grow by 10% per year only; and PMDN investment capital increment of only 0.5% per year. Export trade value will increase by 8.4% per year with a weight growth of -3.7%. While import weight growth and trade value 0.4% and 9.5% per year. It is predicted that in the year 2020 the foreign trade weight in Tanjung Priok port is about 31,3 million tons or equal to 1.95 million TEUs.

Ceteris paribus assuming that rupiah currency will increase at 0,5% per year only, export price increase at 7% , non oil export price at 5%; import price increase only about 4.5%; production growth about 3%; interest rate stagnant; PMDN investment of 1.5% per year. Export trade value will increase by 6% per year with weight growth of 3.5% While the growth of import weight and value trade is about 3.1%and 5.6% per year. It is estimated that in year 2020 the weight of foreign trade in Tanjung Priok port could reach 52.6 million tons or equals to 3.25

millions TEUs.

In optimistic scenario, it is assuming that rupiah currency movement will strengthen to 1.0 % per year. Within the period of 2020, rupiah currency is projected to strengthen towards Rp 8000-8500 per US$. Export price rise around 2 %, as well as non gas export price; import price down only of -0.5 %; production grow about 6 %; interest rate of 2020 is of 6 % only; PMA number will grow 20 % per year; and PMDN investment capital increase of only 2% per year. This scenario analysis result shows that trading value will increase around 5.6 % per year with weight growth of 7.5 %. The decrease of export value growth comparing to the ceteris paribus scenario caused by the rise of rupiah exchange rate which cause our export price is no longer competitive when converted into rupiah while import weight growth and import trade value is of 6.2% and 2.4 % per year. In the year of 2020, the foreign trade in Tanjung Priok port will reach about 81.2 million tons or equals to 5.4 millions TEUs. Result on pessimistic, cateris paribus and optimistic scenario is shown at Table 13.

Table 12
Tanjung Priok Port Import Value Analysis

Dependent Variable	Coefficient	Pr > | t |	Short Term Elasticity	Long Term Elasticity	
Intercept	-935089453	<.0001	---	---	
Priok_Import_ Volume	0.56099	<.0001	0.24	0.38	
Lag 1 (Import_PI)	5320483	<.0001	0.17	0.26	
Lag 3 (Import_OI)	3588542	0.0023	0.11	0.17	R2 = 92.74%
Lag (Priok_Import_ Value)	0.35912	<.0001	---	---	DW = 2.039

Source: Data Processed

Table 13
Tanjung Priok Port 2010 – 2020 Foreign Trade Projection

Year	Pessimistic Scenario				Ceteris Paribus Scenario				Optimistic Scenario			
	Priok Export Value (Juta US)	Priok Export Volume (000 Ton)	Priok Import Value (Billion US$)	Priok Import Volume (000 Ton)	Priok Export Value (Juta US$)	Priok Export Volume (000 Ton)	Priok Import Value (Billion US$)	Priok Import Volume (000 Ton)	Priok Export Value	Priok Export Volume (000 Ton)	Priok Import Value (Billion US$)	Priok Import Volume (000 Ton)
1999	15,718	15,275	11,334	18,253	13,718	15,275	11,334	18,253	13,718	15,275	11,334	18,253
2000	18,817	15,607	15,637	18,944	18,817	15,607	15,637	18,944	18,817	15,607	15,637	18,944
2001	17,568	15,399	14,653	17,884	17,568	15,399	14,653	17,884	17,568	15,399	14,653	17,884
2002	17,583	17,954	14,764	19,864	17,583	17,954	14,764	19,864	17,583	17,954	14,764	19,864
2003	18,000	15,624	14,668	18,244	18,000	15,624	14,668	18,244	18,000	15,624	14,668	18,244
2004	21,696	16,404	21,074	22,111	21,696	16,404	21,074	22,111	21,696	16,404	21,074	22,111
2005	24,074	15,312	23,046	21,226	24,074	15,312	23,046	21,226	24,074	15,312	23,046	21,226
2006	26,076	16,088	24,267	21,318	26,076	16,088	24,267	21,318	26,076	16,088	24,267	21,318
2007	28,011	16,829	30,899	23,563	28,011	16,829	30,899	23,563	28,011	16,829	30,899	23,563
2008	31,692	14,371	54,384	28,363	31,692	14,371	54,384	28,363	31,692	14,371	54,384	28,363
2009	28,045	13,262	40,826	24,158	28,045	13,262	40,826	24,158	28,045	13,262	40,826	24,158
2010	36,918	15,397	45,489	14,281	36,576	16,963	44,548	19,102	35,375	17,058	45,548	23,999
2011	40,620	14,998	48,674	14,115	39,412	17,284	50,596	23,381	37,648	17,748	52,307	32,594
2012	44,693	14,641	54,237	14,328	42,110	17,684	53,899	23,452	39,829	18,771	54,072	33,579
2013	49,169	14,163	60,354	14,642	44,745	18,119	56,925	25,706	42,005	20,126	54,726	34,323
2014	54,077	15,611	66,763	15,479	47,291	18,625	59,695	24,417	44,154	21,817	54,847	35,384
2015	59,366	13,045	73,581	16,259	49,803	19,239	62,345	25,125	46,364	23,895	54,639	36,376
2016	64,077	12,449	80,797	17,236	52,276	19,970	64,769	25,843	48,644	26,358	54,100	37,321
2017	68,831	11,868	88,430	18,209	54,748	20,854	67,013	26,471	51,057	29,244	53,337	38,176
2018	73,325	11,309	96,520	19,182	57,252	21,922	69,107	27,007	53,664	32,589	52,430	38,967
2019	77,611	10,794	105,090	20,109	59,827	23,215	71,070	27,445	56,536	36,443	51,432	39,708
2020	81,703	10,344	114,185	20,965	62,527	24,786	72,936	27,789	59,676	40,772	50,395	40,421
Growth												
2000-2009	5,8%	1,1%	10,2%	3,2%	5,8%	1,1%	10,2%	3,2%	5,8%	1,1%	10,2%	3,2%
2010-2020	8,4%	-3,7%	9,5%	0,4%	6,0%	3,5%	5,6%	3,1%	5,6%	7,8%	2,4%	6,2%

4.3. Dry Port Potential Market

Result on container service projection of Tanjung Priok Port is then used as the basis of potential projection of Bekasi and Karawang. Projection assumption for both area is using historical data of 2004 to 2009 where around 62% container from Tanjung Priok port were originally from both residences. However, there are some differences in the import data because not all containers listed in Import Confirmation (PIB) documents are delivered to the industrial area. Therefore, assumption of 56 % is taken into account for imported goods sent to industrial area (in spite of 90% as listed). From this assumption, projection of export and import container within the industrial area is made. Complete result of each projection scenario is shown in Table 14.

Table 14
2010 – 2020 Industrial Area Container Throughput Projection

Year	Pessimistic Scenario		Ceteris Paribus Scenario		Optimistic Scenario	
	Export (000 TEUs)	Import (000 TEUs)	Export (000 TEUs)	Import (000 TEUs)	Export (000 TEUs)	Import (000 TEUs)
2008	597	752	595	839	613	844
2010	567	538	613	835	631	1030
2015	480	612	695	946	884	1562
2020	380	789	895	1,046	1509	1735

Container service projection is then broken down into daily contribution as indicated in Table 15. From this table we can see container contribution of all scenarios are more than 1000 thousands TEUs, both export and import.

Table 15
Container Daily Throughput from and to Industrial Area of 2010-2020

Year	Pessimistic Scenario		Ceteris Paribus Scenario		Optimistic Scenario	
	Export (000 TEUs)	Import (000 TEUs)	Export (000 TEUs)	Import (000 TEUs)	Export (000 TEUs)	Import (000 TEUs)
2008	1,635	2,059	1,637	2,299	1,679	2,314
2010	1,553	1,473	1,679	2,288	1,730	2,822
2015	1,315	1,678	1,904	2,592	2,423	4,279
2020	1,042	2,163	2,452	2,867	4,134	4,754

4.4. Comparative Advantage of the Existing Service

Comparative strength is needed to cover aspects of dryport services comparing to existing services. This comparative analysis related with timely delivery/forwarding, cargo security and insurance. Timely delivery related also with delivery speed that existing forwarding system (by truck) has a highly flexibility schedule where customer himself can choose the delivery time. One of the factors which enabling this higher supply of container truck than forwarding demand. Challenge on existing services is more to worsen traffic condition which ended in longer delivery time. While weakness of the service system planned by dry port development which utilizing railway for delivery transportation is relatively fix schedule (as scheduled in existing railway time table). Strength of the dry port system is elimination of traffic jam. Both strength and weakness of timely and speed of delivery can become the basis of developing a flexible, timely and efficient dry port schedule

Forwarding security is one of the main concerns of the customer. Market survey on dry port (chapter 4) shows that usually customer providing extra money to confirm the container delivered to container yard and shipped. This extra cost used to pay guardian service all the way to the port or security charges in port zone. Referring to existing service system, security system of the dry port should reduce all security issues. Documents settlement and administration processing in dry port, closer distance from dry port to industrial zone (customer can monitor the goods at any time), and delivery by railway are security promising factors for customer. However, one concern is cargo safety at the port of before shipping. It needs special security system to ensure the same security level provided at dry port.

5. CONCLUSION

From these market study analyses, it is found that establishment of dry-port to support Tanjung Priok port is essential. Benefits could be twofold, there are; firstly such establishment would somehow release the traffic problems of moving commercial vehicles, and secondly the existence of dry-port would also stimulate industrial growth in both quantity of products and quality of service. Urgency of such dry-port is not apparently due to limited capacity of existing port but also distribution efficiency which is also the cause of high-cost economy.

Otherwise, the weakness of the service system planned by dry-port development which utilizing railway is relatively fix schedule. However, existing forwarding system (by truck) has a highly flexibility schedule where customer himself can choose the delivery time. Both benefits and weakness could become the basis of developing an effective and efficient dry-port system.

REFERENCES

Greene, W. H. (1993) *Econometric Analysis*. MacMillan, New York

Tambunan, Tulus T.H (2001) Exports - Indonesia; Manufacture – Indonesia, Indonesian Commerce and Chambers, Jakarta

NTT Data Institute of Management Consulting, Inc (2005) Overview of the 2004 Survey on the Current Status and Market Size of Electronic Commerce, Jakarta

Government of Rajasthan, Jaipur (2004) Multi-modal logistic center (Dry-Port) at Bhiwadi region, Rajasthan

World Bank (2003) World Economic Outlook, New York

Central Bureau of Statistics (2008) The Overview of Indonesian Exports and Imports in May 2008,Jakarta

The Asia Foundation and The University of Indonesia's Institute for Economic and Social Research (LPEM-FEUI) (2005) Study of Logistics Costs in Indonesia, Jakarta