Evaluating the Shift in Incoterms for Indonesian Export Products

FINAL REPORT

PT. ITS Kemitraan
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Preface

The Ministry of Trade (MoT) of Republic of Indonesia has requested the support of the World Bank in devising new and improve trade related policies for the benefit of the Indonesian economy. The MoT - with the help of the World Bank - has identified a number of areas where there is a need to fill knowledge gaps in order to inform policy-making.

One of the identified areas is promoting "beyond cabotage" under the assumption that changing term of delivery from FOB to CIF will promote the Indonesian-flag vessels which in turn the Indonesian economy will be benefited. To that end the World Bank has mandated PT. ITS Kemitraan to develop a study on evaluating the shift in term of delivery from FOB to CIF for Indonesian export products under the supervision of World Bank staff. The study should evaluate four commodities, such as Crude Palm Oil (CPO), coal, rubber and shrimp, where these commodities are known as the main Indonesian export products.

This study aims to evaluate the shift in terms of delivery on four key export commodities as well as to explore the advantages and disadvantages of changing the terms of delivery. Due to difference in characteristics of each export product, then we present the analysis based on the commodity. Overall, we also provide conclusion and recommendation in accordance with the entire analysis results.

On behalf of all partners, we would like to thank for your cooperation and contribution. We wish you a good reading of this final report. We look forward to receiving the positive comments and the valuable feedbacks to improve the results of this study.

Surabaya, December 2016

PT. ITS Kemitraan

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Nomenclature

Buyer	:	a person who makes a purchase (importer, consignee)
CIF	:	Cost, Insurance and Freight
CFR	:	Cost and Freight
CPO	:	Crude Palm Oil
FAS	:	Free Alongside Ship
Flag of Convenience	:	registry of a merchant ship under a foreign-flag in order to profit from less restrictive regulations
FOB	:	Free on Board
FOC	:	Flag Of Convenience
Foreign-flag vessel	:	a vessel having a registry under a nationality other than Indonesia
HSD	:	High Speed Diesel
Indonesian-flag vessel	:	ship registered under Indonesia's regulation
LWS	:	Low Water Spring
MFO	:	Marine Fuel Oil
MoT	:	Ministry of Trade of the Republic of Indonesia
Nm	:	Nautical miles
RFR	:	Required Freight Rate
SFOC	:	Specific Fuel Oil Consumption
T/C	:	Time Charter
TCH	:	Time Charter Hire
ToD	:	Terms of Delivery
V/C	:	Voyage Charter
Seller	:	a person who sells something (exporter, shipper, cargo owner)

Explanatory Notes

- All references to dollars ($) are to United States of America dollars, unless otherwise stated;
- Unless otherwise stated, “ton” means metric ton (1,000 kg), “mile” means nautical mile, “Ha” means hectare;
- Because of rounding, details and percentages presented in tables and graphics do not necessarily add up to the totals;
- n.a. means not available;
- A hyphen (-) signifies that the amount is nil;

1 Introduction

1.1 Background

The process of trade policy-making requires identification and evaluation of alternative options to achieve specific public policy objectives as well as the impact assessment of the alternative options to the existing policies. In this context, the Ministry of Trade (MoT) of Republic of Indonesia has requested the support of the World Bank in devising new and improve existing international trade related policies for the benefit of Indonesian economy. The MoT - with the help of the Bank - has identified a number of areas where there is a need to fill knowledge gaps in order to inform policy-making.

One of the identified areas is promoting "beyond cabotage" under the assumption that changing term of delivery from FOB to CIF will promote the Indonesian-flag vessels, which in turn the Indonesian economy will be benefited. To that end the World Bank has mandated PT. ITS Kemitraan to conduct a study on evaluating the shift in term of delivery from FOB to CIF for Indonesian export products under the supervision of the World Bank staff. The study aims to evaluate the use of FOB vs CIF on four key Indonesian export products, namely crude palm oil, coal, rubber and shrimp.

The majority of Indonesian export products are shipped under Free on Board (FOB) term while import products are under Cost, Insurance and Freight (CIF) term. Currently, it is estimated that 95% of Indonesian foreign trade is shipped with foreign-flag vessels.

The Government of Indonesia (in this context the MoT) is exploring ways to increase the use of CIF for exports and FOB for imports in order to increase the participation of locally established freight forwarders, insurance firms and shipping companies. This vision is labeled as "beyond cabotage".

Theoretically, shifting the term of delivery from FOB to CIF will allow the exporters to demand higher prices as they will organize the sea transportation and carry risk further down the supply chain. Similarly, the usage of FOB term on imports can generate lower prices as the importer will organize sea transport and carry risk earlier in the supply chain.

Nevertheless, moving towards a CIF regime for exports and a FOB for imports not only has the potential to improve the balance of services, but also can have negative impacts. In buyer driven markets there is little room for the seller to negotiate the term of delivery. Large brands and retailers often dictate FOB

or even Ex Works (EXW) in order to have full control on delivery and reduce storage costs (floating stock). If Indonesia has to compete with other countries over homogeneous products such as textile and footwear, forcing the use of CIF could potentially damage these manufacturing industries. Therefore, this study is conducted in order not only to evaluate the shifting term of delivery on four key export commodities, but also to explore the advantages and disadvantages of shifting term of delivery.

In addition, changing the term of delivery from FOB to CIF for export products does not necessarily increase the participation of Indonesian-flag vessels as a main carrier. Meaning that even under CIF term, exporters can still select foreign-flag vessels as a main carrier. Therefore, the evaluation of advantages and disadvantages due to shifting the term will be elaborated in this study.

1.2 Objectives

According to the Terms of Reference, the objectives of this study are as follows:

1. To identify the general use of Incoterms in terms of tasks, costs and risks for seller and buyer, especially for export products in Indonesia;
2. To evaluate the opportunities of shifting the term of delivery on selected commodities (coal, CPO, shrimp and rubber) from FOB to CIF;
3. To explore the advantages and disadvantages of shifting the term of delivery from the macro perspectives;
4. To provide the recommendation to increase export revenues.

1.3 Scope of Works

The scope of works of this study are as follows:

1. General overview of Incoterms and its implementation in Indonesia;
2. Analyzing the selected commodity market, consisting of:
    a) The importance of the selected products on the overall export basket in Indonesia.
    b) The global market share of the selected products and the main importing countries.
    c) Type of shipment (liner or tramp) commonly used for the selected products and the availability of Indonesian-flag vessel to potentially offer the service.
    d) Term of delivery commonly used for the selected products.

3. Evaluating the opportunities of shifting the term of delivery for the selected products;
4. Elaborating the advantages and disadvantages of shifting the term of delivery from exporters, freight forwarders, insurance firms and shipping companies point of views;
5. Providing conclusion and recommendation.

1.4 Methodology

In order to meet the objectives of this study, a methodology has been developed as depicted in Figure 1.1.

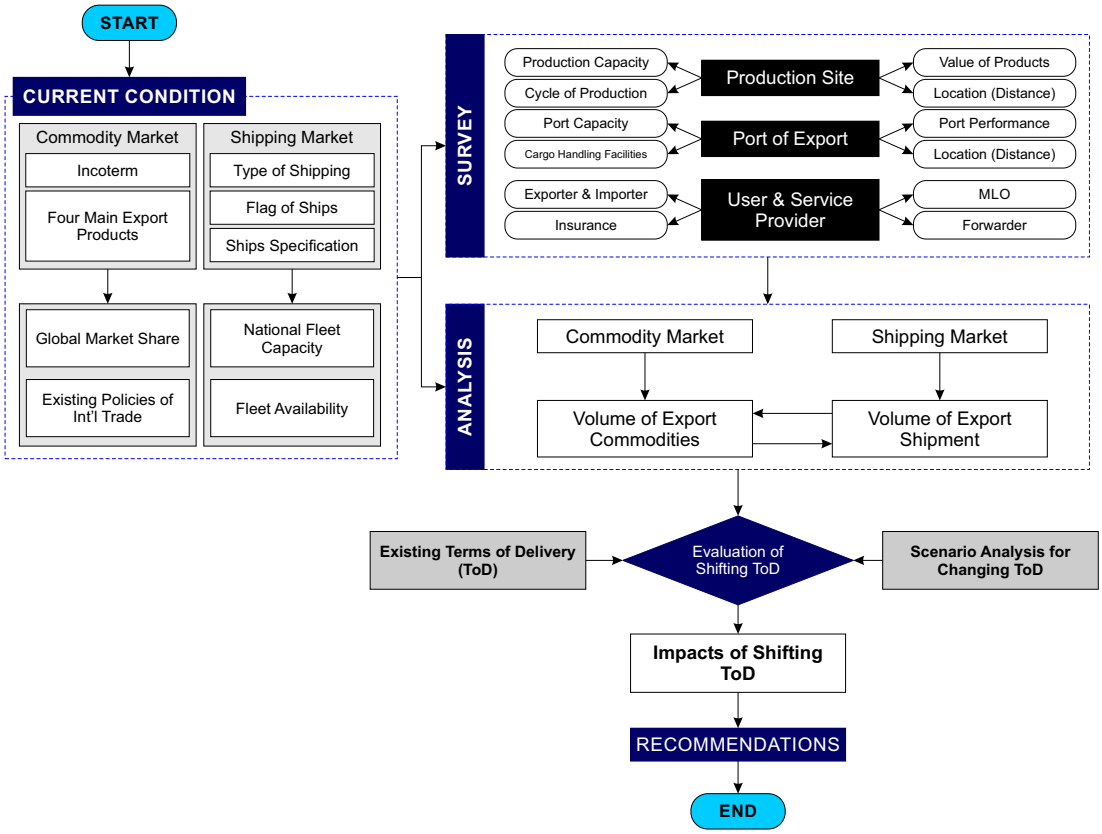


Figure 1.1: Methodology

This methodology can be describe as follows:

1. In order to capture the current conditions in term of commodity and shipping market for the selected export products, some analysis will be conducted in this stage as follows:

a) Commodity Market

i. Reviewing the general use of Incoterms especially for selected products (crude palm oil, coal, rubber and shrimp).

ii. Identifying the importance of the selected export products, the global market share of those products, the main importing countries and the current term of delivery being used.

iii. Determining the volume of export commodities, including crude palm oil, coal, rubber and shrimp.

b) Shipping Market

i. Identifying the type of shipping, flag of ships and ship specification for each ship that serve the international trade for selected export products.

ii. Analyzing the shipping market to obtain the fleet capacity and fleet availability to serve the International trade from and to Indonesia.

iii. Determining the volume of export shipments for dry bulk, liquid bulk and container.

2. Conducting survey to capture the current capacity, facility and location for each site and port. Moreover, in order to get some ideas with regard to the use of current Incoterms for export commodities as well as the existing policy under the current terms of delivery.

a) Production sites

b) Ports of export for selected export products

c) Users and service providers, such as exporter, importer, forwarder, main line operator or shipping line, and insurance company.

3. Evaluate shifting the current term of delivery for export products into a CIF term:

a) Analyze the current condition of the existing terms of delivery for Indonesian export commodities

i. Analyze the potential impacts by using the current term of delivery.

ii. Identify the freight under the current term of delivery.

b) Scenario analysis is to analyze the alternative in operating the ship, which is used to serve Indonesian export commodities after shifting the term of delivery into a CIF term. There are two scenarios on this analysis including:

   i. Scenario 1: Voyage charter
      A. Determine the voyage charter hire.
      B. Formulate the Required Freight Rate (RFR) on the one-way voyage.
      C. Identify the freight rate on a CIF term.
      D. Compute the difference of freight between using the current term of delivery and a CIF term for each export product.
   ii. Scenario 2: Time charter
      A. Determine the time charter hire.
      B. Formulate the Required Freight Rate (RFR) on the round trip scheme.
      C. Identify the freight rate on a CIF term.
      D. Compute the difference of freight rate by using voyage charter and time charter for each export product.
   iii. Determine the potential freight of Indonesian shipping for each export product.
4. Elaborate the advantages and disadvantages due to shifting the term of delivery for exporters, freight forwarders, insurance firms and shipping lines.
5. Provide alternatives of new policy as recommendation based on the analysis results.

2 Basic Concepts

This chapter deals with some basic concepts and information required in order to understand the way how evaluation of shifting the term of delivery in this study conducted. There are at least 2 (two) basic concepts will be covered briefly in this chapter, namely Incoterms and shipping business. By introducing these basic concepts, it is hoped that the readers will have the same perspective so that the readers could follow how the calculation conducted in this study.

The first concept is dealing with the general overview of Incoterms. Classifications and rules of Incoterms will be explored in this part as well as division of costs and risks between the parties involved. In addition, the implementation of Incoterms in Indonesia will be covered in this part as well.

The second part introduces the theory of shipping, where classification of shipping business will be explored in this part. Since the characteristics of each commodity transported is different, thus this part presents the type of ships commonly used for each commodity and covers all costs incurred in each ship type. In the last part, we present how the shipping market in Indonesia looks like from the perspective of Indonesian-flag vessels' availability.

2.1 Incoterms

2.1.1 An Overview of Incoterms

In every transactions of trade between buyers and sellers (or importers and exporters), they must have a common understanding and perception of the terms and conditions under which they trade. Therefore, in order to avoid conflicts and difficulties between parties involved, standard trade definitions most commonly used in international trade is needed. This standard trade definitions was developed and administered by the International Chamber of Commerce (ICC) in Paris.

International Commercial Terms ("Incoterms") are internationally recognized standard trade terms used in contracts of sale (not of the contract of carriage). Incoterms inform the parties what to do with respect to carriage of the goods from buyer to seller as well as export and import clearance. They also explain the division of costs and risks between the parties.

Incoterms rules were introduced the first time in 1936 and revised for the first time in 1957 and thereafter in 1967, 1976, 1980, 1990 and 2000. This appears to suggest that, in recent times, the Incoterms rules have been revised at 10-year intervals. It is merely a coincidence that the last three revisions are separated by 10-year periods. Indeed, the main purpose of the Incoterms rules is to reflect international commercial practice, which doest not change at a set interval. The latest version is Incoterms 2010 and entered into force on January 2011.

The number of Incoterms rules has been reduced from 13 to 11 in Incoterms 2010. Other primary note of Incoterms 2010 is that instead of "terms" they are now referred to as "rules". Incoterms 2010 classifications are now applicable in two sections: i) for any mode or modes of transport; and ii) for inland waterway or sea freight. This classification is broken down as shown in Table 2.1. Incoterms are used in contracts in a 3-letter format followed by the place specified in the contract (e.g. the port or where the goods are to be picked up).

Table 2.1: Classifications or Rules in Incoterms 2010

Rules for Any Mode or Modes of Transport		Rules for Sea and Inland Waterway Transport	
EXW	Ex Works	FAS	Free Alongside Ship
FCA	Free Carrier	FOB	Free On Board
CPT	Carriage Paid To	CFR	Cost and Freight
CIP	Carriage and Insurance Paid to	CIF	Cost Insurance and Freight
DAT	Delivered at Terminal (new)		
DAP	Delivered at Place (new)		
DDP	Delivered Duty Paid		

The first class includes the seven rules that can be used irrespective of the mode of transport selected and irrespective of whether one or more than one mode of transport is employed. They can be used even when there is no maritime transport at all. It is important to remember, however, that these rules can be used in cases where a ship is used for part of the carriage.

In the second class, the point of delivery and the place to which the goods are carried to the buyer are both ports; hence it is labelled as "sea and inland waterway" rules. Under the last three rules, all mention of the ship's rail as the point of delivery has been omitted in preference for the goods being delivered when they are "on board" the vessel.

The following sub-section is general information (and very brief) overview of Incoterms 2010 rules for each class:

Any Mode or Modes of Transport

1. EXW – Ex Works (named place of delivery)

   The seller delivers when it places the goods at the disposal of the buyer at the seller's premises or at another named place (i.e.,works, factory, warehouse, etc.). The seller does not need to load the goods on any collecting vehicle, nor does it need to clear the goods for export, where such clearance is applicable.

2. FCA - Free Carrier (named place of delivery)

   The seller delivers the goods to the carrier or another person nominated by the buyer at the seller's premises or another named place. The parties are well advised to specify as clearly as possible the point within the named place of delivery, as the risk passes to the buyer at that point.

3. CPT - Carriage Paid To (named place of destination) and CIP – Carriage And Insurance Paid To (named place of destination)

   The seller delivers the goods to the carrier or another person nominated by the seller at an agreed place (if any such place is agreed between parties) and that the seller must contract for and pay the costs of carriage necessary to bring the goods to the named place of destination. 'The seller also contracts for insurance cover against the buyer's risk of loss of or damage to the goods during the carriage. The buyer should note that under CIP the seller is required to obtain insurance only on minimum cover. Should the buyer wish to have more insurance protection, it will need either to agree as much expressly with the seller or to make its own extra insurance arrangements."

4. DAT - Delivered At Terminal (named terminal at port or place of destination)

   The seller delivers when the goods, once unloaded from the arriving means of transport, are placed at the disposal of the buyer at a named terminal at the named port or place of destination. "Terminal" includes a place, whether covered or not, such as a quay, warehouse, container yard or road, rail or air cargo terminal. The seller bears all risks involved in bringing the goods to and unloading them at the terminal at the named port or place of destination.

5. DAP - Delivered At Place (named place of destination)

   The seller delivers when the goods are placed at the disposal of the buyer on the arriving means of transport ready for unloading at the named place of destination. The seller bears all risks involved in bringing the goods to the named place.

6. DDP - Delivered Duty Paid (named place of destination)

   The seller delivers the goods when the goods are placed at the disposal of the buyer, cleared for import on the arriving means of transport ready

for unloading at the named place of destination. The seller bears all the costs and risks involved in bringing the goods to the place of destination and has an obligation to clear the goods not only for export but also for import, to pay any duty for both export and import and to carry out all customs formalities.

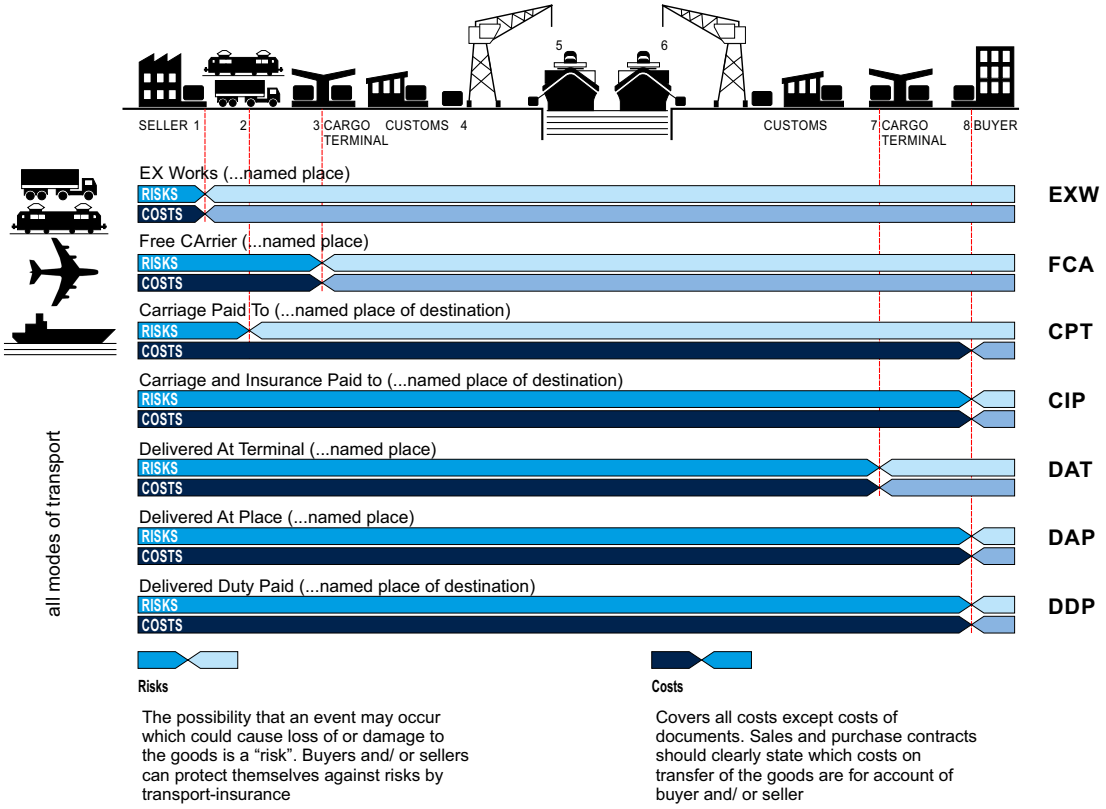


Figure 2.1: Incoterms Rules for All Modes of Transport

Sea and Inland Waterway Transport

1. FAS - Free Alongside Ship (named port of shipment)

   The seller delivers when the goods are placed alongside the vessel (e.g., on a quay or a barge) nominated by the buyer at the named port of shipment. The risk of loss of or damage to the goods passes when the goods are alongside the ship, and the buyer bears all costs from that moment onwards.

2. FOB - Free On Board (named port of shipment)

   The seller delivers the goods on board the vessel nominated by the buyer at the named port of shipment or procures the goods already so delivered. The risk of loss of or damage to the goods passes when the goods are on board the vessel, and the buyer bears all costs from that moment onwards.

3. CFR - Cost And Freight (named port of destination)

   The seller delivers the goods on board the vessel or procures the goods already so delivered. The risk of loss of or damage to the goods passes when the goods are on board the vessel. The seller must contract for and pay the costs and freight necessary to bring the goods to the named port of destination.

4. CIF - Cost, Insurance And Freight (named port of destination)

   The seller delivers the goods on board the vessel or procures the goods already so delivered. The risk of loss of or damage to the goods passes when the goods are on board the vessel. The seller must contract for and pay the costs and freight necessary to bring the goods to the named port of destination. The seller also contracts for insurance cover against the buyer's risk of loss of or damage to the goods during the carriage. The buyer should note that under CIF the seller is required to obtain insurance only on minimum cover. Should the buyer wish to have more insurance protection, it will need either to agree as much expressly with the seller or to make its own extra insurance arrangements.

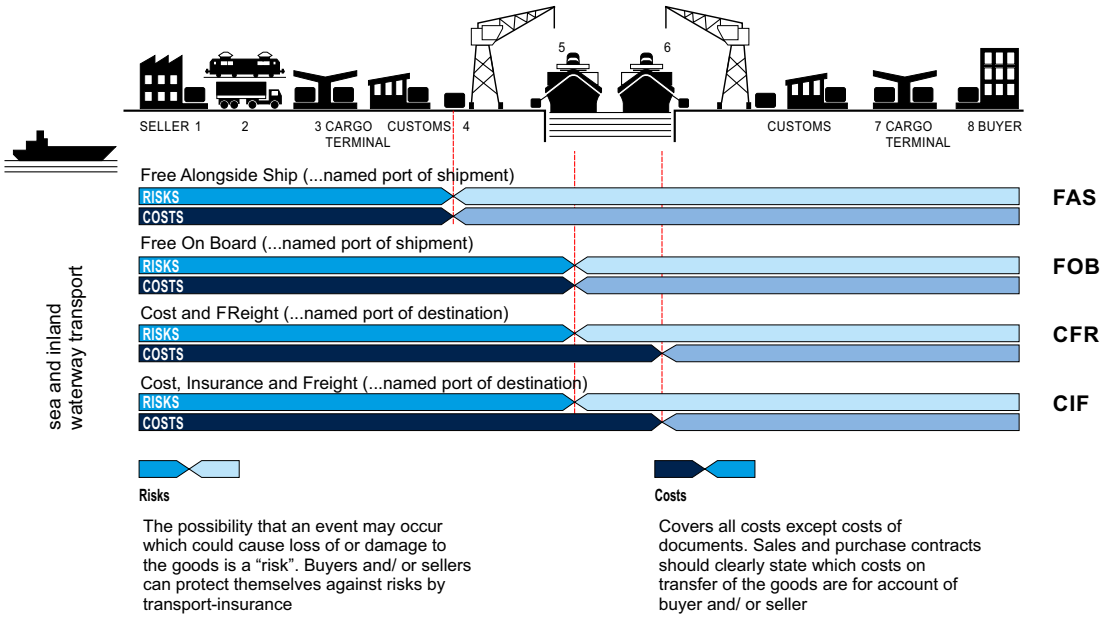


Figure 2.2: Incoterms Rules for Sea and Inland Waterway Transport

2.1.2 Incoterms in Indonesia

The government policy of PM No. 41/PMK.04/2014 about *"The Procedure of Filling the Export Transaction Value by CIF on the Export Declaration"*, the government obligated to use terms of delivery of CIF for Indonesian export prod-

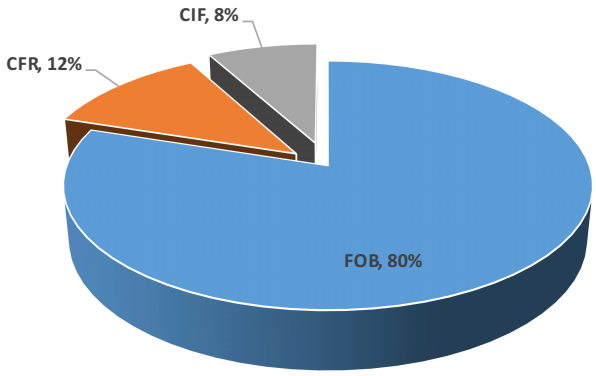
ucts. It means that a CIF term should be added on the export declaration (PEB) since March, 1st 2014.

This policy was a follow-up from the previous policy, which was published by Ministry of Trade (MoT) under the policy of PM No.01/M-DAG/PER/1/2014 on January, 2nd 2014, about *"The Procedure of Strengthening the Freight and Insurance for Filling the Export Declaration in Terms of Using Term of Delivery Cost, Insurance and Freight for Export Activity"*.

The objective of this policy is to increase the validity and accuracy of freight and insurance, which are registered on Indonesian Balance of Payment (NPI). Moreover, it is also hope that by introducing this policy could encourage the participation of not only national shipping companies, but also insurance and freight forwarder industries, simultaneously.

Before implementing this policy, all of export transaction data on the export declaration were stated as FOB. Even though, in fact, the sellers and buyers applied different Terms of Delivery (i.e: CFR, CIF or Ex-works). As a consequence, it affected on the differences of recording systems between the Ministry of Finance and Bank of Indonesia (BI), whereby BI has currently recorded Indonesian export transactions by using CIF.

Additionally, in order to minimize the differences, the government obligated to use a CIF term on the export declaration (PEB) merely for Indonesian export products. However, this policy could not directly be implemented on the main Indonesian export products, since it takes time for adapting this policy. Therefore, MoT suggested to firstly applying this policy only for two key export products, which are crude palm oil and coal. Only if other Indonesian industries have a better bargaining position to compete with foreign companies, this policy would actually be implemented for all Indonesian export products.



Source: Modified from Bank Indonesia (2013)

Figure 2.3: Proportion of Incoterms in Indonesia

Commonly, the implementation of Incoterms in Indonesia could be divided into three terms of delivery, such as FOB, CFR and CIF. Meanwhile, considering data from Bank of Indonesia in 2013 (started from January to July) stated that ToD was dominated by FOB (80%), followed by CFR (12%) and CIF (8%).

2.2 Shipping

Transport (in all modes) is the essential link between supplier and receiver, and the aim is to receive the goods in good condition, when and where they are needed with an affordable price. Since most of Indonesian export products are shipped by sea transportation mode, then understanding the type of ships commonly used, how they are operate and how the freight rate determined are indispensable.

This part introduces a basic concept of how the shipping industry be classified, what types of ship commonly used in shipping market as well as the consequences on costs structure. Afterwards, how to determine the freight rate is also elaborated in this section.

2.2.1 Shipping Services

Based on the operational characteristics, the shipping business can be categorized into three services: liner shipping, tramp (bulk) shipping and specialized shipping. Following a brief explanation on each service:

Bulk (Tramp) Shipping

The bulk shipping industry provides transport services for cargo that appear on the market in shiploads. The principle of this industry is “one ship, one cargo”, although we cannot be too rigid about this principle. Most of the bulk cargoes are drawn from the raw material trades such as crude or product oil, iron ore, coal, grain, etc. and are often described as “bulk commodities”. Bulk cargoes usually are characterized with low value and high volume.

A shipper with bulk cargo to transport can approach the task in several ways, depending on the cargo itself and the nature of operation required. The choices range from total involvement by owning the ships to handing the whole job over to a specialist bulk shipper. If the shipper has a long-term requirement for bulk transport but does not wish actively involved as a shipowner, he may charter tonnage on a long-term basis from shipowner. Shipper with only single cargo to transport due to short-term contract or seasonal characteristics, then short-term charter or spot charter would be the best alternative even with the higher freight.

By the principle of “one ship, one cargo” then the operation (schedule and routes) of the ships cannot be planned in advance. In other words, ships routes and schedules are highly depended on the availability of the cargo. The consequence of these characteristics, tariff (freight) cannot be fixed in advance.

Liner Shipping

In term of operation, liner shipping is quiet different compare to the bulk shipping. Volume of cargoes to transport are too small to justify setting up a bulk operation (one ship, one cargo) therefore, the cargo need to be consolidated with other cargoes. In shipping terms, this cargo often described as "general cargo" and usually characterized with high value and low volume. Additionally, they are often requiring a service for which the shippers prefer a fixed tariff rather than a fluctuating rate.

From the operational point of view, liner shipping is much more difficult than bulk shipping since liner operator must be able to:

- Offer a regular service for many small cargo consignments and process the associated mass of paperwork;
- Charge individual consignments on a fixed tariff basis that yields an overall profit — not an easy task when many thousands of consignments must be processed each week;
- Load the cargo/container into the ship in a way that ensures that it is accessible for discharge (bearing in mind that the ship will call at many ports) and that the ship is 'stable' and 'in trim';
- Run the service to a fixed schedule while allowing for all the normal delays — arising from adverse weather, breakdowns, strikes, etc.; and
- Plan tonnage availability to service the trades, including the repair and maintenance of existing vessels, the construction of new vessels and the chartering-in of additional vessels to meet cyclical requirements, and to supplement the company's fleet of owned vessels.

Therefore, skill, expertise and organizational management are essential factors on the liner shipping operators. The liner shipping business is particularly vulnerable to marginal cost pricing by other shipowners operating on the same routes. Transporting small volume of cargo with many cargo owners faces the liner operator with a complex administrative task compared to the tramp shipping operators.

Specialized Shipping

"Specialized" shipping sits somewhere between the liner and the bulk shipping and has characteristics of both. The principal distinguishing feature of these specialized trades is that they use ships designed to carry a specific cargo type (this character belong to bulk shipping) and provide a service, which is targeted at a particular customer (specific routes).

Perhaps the best example of a specialized shipping is car carrier. The cars are large, high-value and fragile unit, which need careful stowage. Therefore, in

order to increase the efficiency of transport service, ships with specific design is needed.

The comparison between the characteristics of liner and tramp shipping can be seen on Table 2.2 as below. Specialized shipping is not included in the comparison since this study is not fit with this type of service.

Table 2.2: Characteristics between Liner and Tramp Shipping

Characteristics	Liner Shipping	Tramp Shipping
Cargo value	Medium to high	Usually low
Shipment size	Small cargo lots	Very large or ship size lots
Cargo package	Container, trailer, pallet, bag, drum	Loose or segregated by dunnage
Service requirements	Scheduled, frequent	Unscheduled, low
Service pricing	Cost driven, berth terms, per tariff (common carriage), contract carriage or space charter	Demand driven, variable terms, voyage/ time/ bareboat charter party (contract)
Vessel design	Highly specialized	Very flexible
Entry barriers	High	Low
Corporation organization	Large, extended	Small, with agents/ brokers
Carriers/ owners	Limited number, concentrated	Opportunistic
Commitment to trade	Usually long-term	Opportunistic
Investment horizon	Usually long-term	Short to medium term

Source: Shipping and Freight Resource (2009)

2.2.2 Ship Types

In general, types of ship can be classified into three groups: cargo ships, off-shore mobile structures, and non-cargo ships. Furthermore, the group cargo ships can be divided into four sectors, namely general cargo, bulk cargo, oil and chemicals and liquid gas. The classification of commercial shipping can be seen in Figure 2.4 [13].

However, the ship types which relevant with this study are only tanker, bulk carrier and container, therefore, description of the type of ships focuses only on these type of ships. The detail descriptions can briefly be shown as follows:

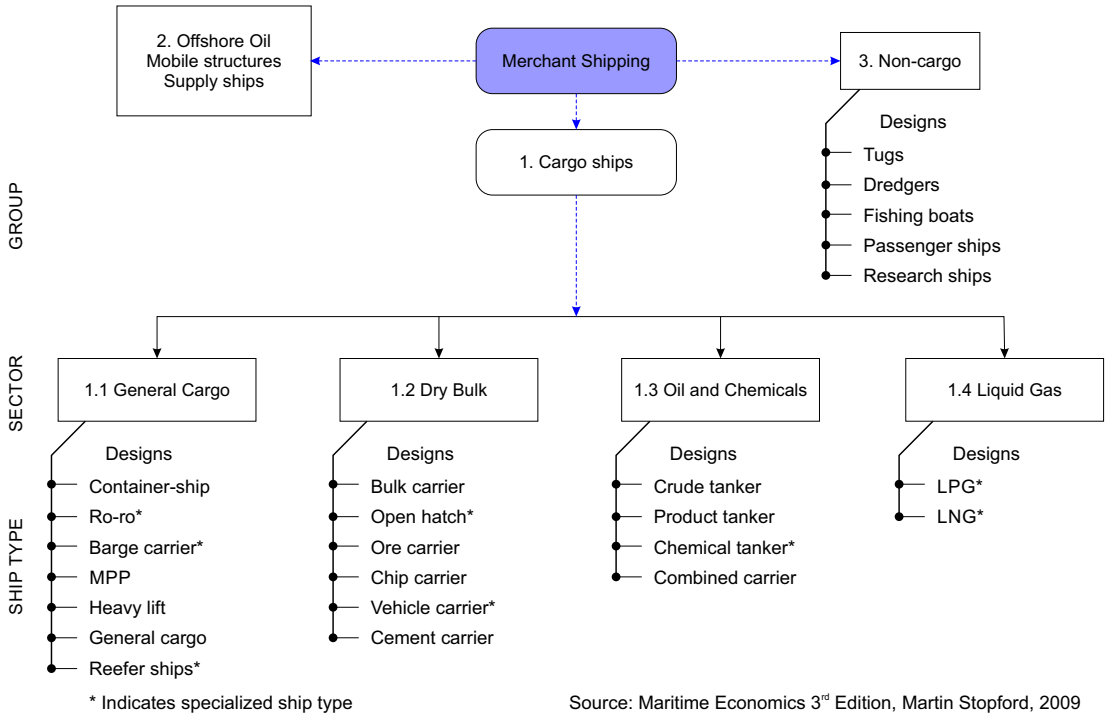


Figure 2.4: The Commercial Shipping Fleet Classification

1. **Tanker**

   Tanker is a ship specially designed to transport liquids in bulk. The main types of tankers are petroleum tankers (crude and product oil), and chemical tanker. Some type of tanker used to refuel other ships called an oiler.

   In general, chemical tankers are used for transporting the following items: organic and inorganic chemicals, lubricating oils, animal and vegetable oils and molasses. The ships commonly used to transport of crude palm oil is chemical tanker.

   Chemical tankers usually have a number of separate tanks, which depends on the material and the coating (e.g. epoxy or zinc paint) on the tanks, can be used to transport different chemicals. Stainless steel tanks can be used for carrying acetous liquids whereas epoxy coated tanks can be used for less aggressive chemicals, e.g. vegetable oils. Parcel tankers that have separate pumps and pipes for each tank are able to handle different chemicals without any mixing. These types of chemical tanker are often used to carry molasses and vegetable oils. For some chemical (e.g. palm oil) it is necessary to maintain a defined temperature so that viscosity remains at a certain level. In this case, a boiler transfers heat to the tanks through heating coils [4].

   In terms of ships size, Shell Oil developed the average freight rate assessment (AFRA) system, which classifies tankers of different sizes, as follows:

DWT	Group Name
10,000 - 24,999	Small tanker
25,000 - 34,999	Intermediate tanker
35,000 - 44,999	Medium Range 1 (MR1)
45,000 - 54,999	Medium Range 2 (MR2)
55,000 - 79,999	Large Range 1 (LR1)
80,000 - 159,999	Large Range 2 (LR2)
160,000 - 319,999	Very Large Crude Carrier (VLCC)
320,000 - 549,999	Ultra Large Crude Carrier (ULCC)

2. **Dry Bulk Carriers**

   A dry bulk carrier is a ship specially designed to transport dry unpackaged bulk cargo, such as grains, coal, ore, etc in its cargo holds. International Maritime Organization (IMO) defines a bulk carrier as a ship constructed by a single deck, top side tanks and hopper side tanks in cargo spaces and intended to primarily carry dry cargo in bulk; an ore carrier, or a combination carrier.

   Dry bulk carriers usually have several holds that are covered by hatches and equipment for loading and unloading of the cargo. In large part the design of dry bulk carriers depends on the density (stowage factor) of the cargo that will be transported. The densities of common cargoes vary from 0.6 tons per cubic meter for light grains to 3 tons per cubic meter for iron ore. For high density cargo the limiting factor for the ship design is the overall weight of the cargo, while for light cargo it is volume.

   In terms of size, dry bulk carriers can be classified as follows [4]:

DWT	Group Name
10,000 - 35,000	Handysize
35,000 - 59,000	Handymax
60,000 - 80,000	Panamax
80,000 and over	Capesize

3. **Container Ships**

   Container ships are cargo ships that carry all of their load in truck-size intermodal containers. They are a common means of commercial intermodal freight transport and now carry most of seagoing non-bulk cargo. Container ship capacity is measured in twenty-foot equivalent units (TEU). Typical loads are a mix of 20-foot and 40-foot (2-TEU) ISO-Standard containers, with the letter predominant.

   Container ships eliminate the individual hatches, holds and dividers of the traditional general cargo ships. The hull of a typical container ship is a huge warehouse divided into cells by vertical guide rails. These cells are designed to hold a cargo in pre-packed units - called containers.

   Containerization has lowered shipping expenses and decreased shipping time (easy in cargo handling), and this in turn helped the growth of inter-

national trade. Prior to containerization, huge gangs of men would spend hours fitting various items of cargo into different cargo holds. Today, with containerization, cranes installed either on the pier or on the ship, are used to place containers on board.

Container ships are distinguished into 7 major size categories, as follows:

TEU	Group Name
up to 1,000	Small feeder
1,001 - 2,000	Feeder
2,001 - 3,000	Feedermax
3,001 - 5,100	Panamax
5,101 - 10,000	Post-Panamax
10,001 - 14,500	New Panamax
14,501 and higher	Ultra Large Container Vessel

2.2.3 Freight Market

Freight market is a market in which sea transport services is bought and sold. Basically, freight market occurs when the shipowner comes to the market with a ship available (free of cargo) and the shipper comes to the market with a volume of cargo to transport.

The freight market has two different types of transaction, the freight contract in which the shipper (cargo owner) buys transport service from the shipowner at a fixed price per ton of cargo, and the time charter under which the ship is hired by a certain period. The freight contract also known as voyage charter suits shippers who prefer to pay an agreed sum of money and leave the management of the transport to the shipowner. On the other hand, the time charter is suitable for cargo owners who experienced in ship operator and prefer to manage the transport themselves.

Regardless of the type of transaction in freight market, the component of shipping costs are the same, the difference in these two types of transaction lies on "who pays what". In other words, the difference lies in the division of responsibility for costs incurred.

In general, the shipping costs can be classified into two main categories. First is the cost of operating the ship, and the second is costs of maintaining and financing the ship. These classifications can be broken down as follows:

1. Cost of operating the ship

   This cost basically constitute the expenses in order to operate the ship. Furthermore, this costs consists of:

   a) Operating Costs, which constitute the expenses involved in the day-to-day running of the ship - essentially those costs such as crew, stores, running repair, insurance and administration.

b) Voyage Costs are variable costs associated with a specific voyage and include such as items as fuel cost, port charges and canal dues.

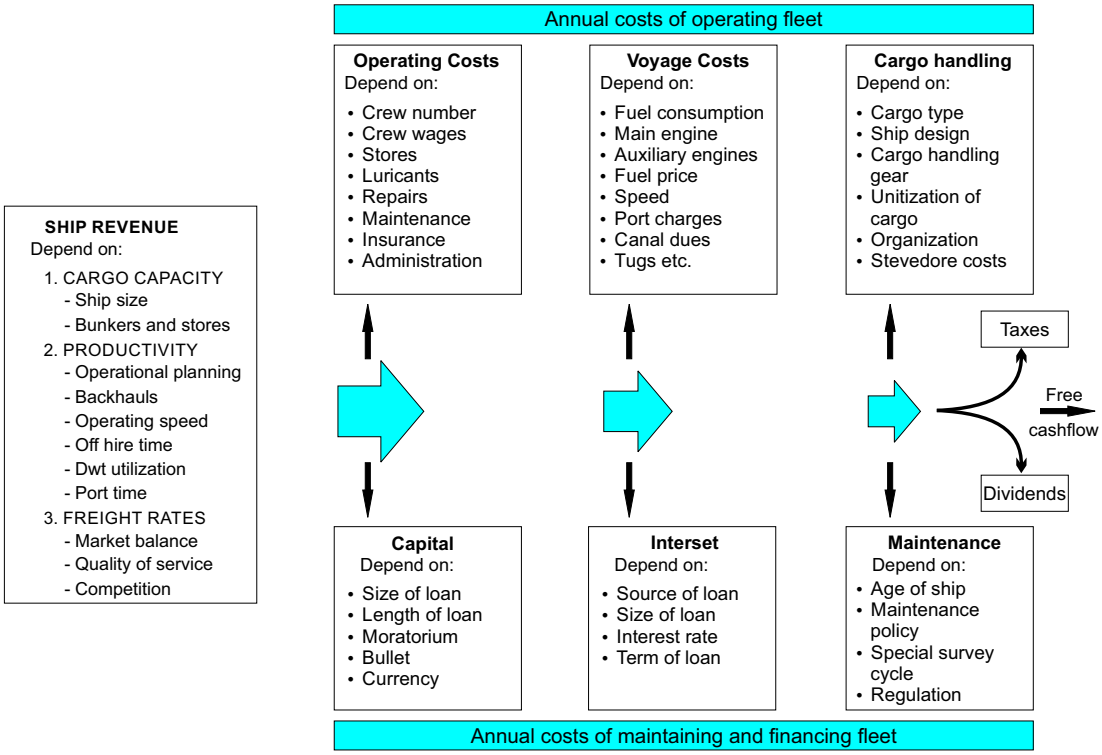
c) Cargo Handling Costs represent the expense of loading, stowing and discharging cargo.

2. Cost of maintaining and financing the ship, which consisting of:

a) Capital Costs, are the costs to finance the ship and depend on the way the ship has been financed. They may take the form of dividends to equity, which are discretionary, or interest and capital payments on debt finance, which are not.

b) Periodic Maintenance Costs are incurred when the ship is dry-docked for major repairs, usually at the time of its special survey. In older ships this may involve considerable expenditure, and it is not generally treated as a part of operating expenses.

The classification of shipping costs can be seen in Figure 2.5.



Source: Maritime Economics 3rd Edition, Martin Stopford, 2009

Figure 2.5: The Components of Shipping Costs

2.2.4 Required Freight Rate

The keys to survival in the shipping market in which shipowners have to work with are the revenue received from operating the ship and cost of running and maintaining the ship. The components of shipping costs are already explained in the pervious sub-section. This section deals with the revenue side of operating the ship.

Revenue received from operating the ship is a multiplication of the freight (price) by volume of cargo transported. Although shipowners do not generally control the freight they receive per ton of cargo, there is a way to estimate whether the ship can generate positive cash flow or not. This can be done by calculating the Required Freight Rate (RFR).

Required Freight Rate (RFR) is the tariff that is able to cover all expenses incurred in the process of sea transport with no profit. In other words, RFR is basic price per ton cargo transported. Meanwhile, freight is the rate (selling price) charged by the shipowner to the shipper that is including shipowner's profit. Thus, the relationship between RFR with freight can be written in the following formula:

$$Freight = RFR + Profit \tag{2.1}$$

Therefore, in order to determine the freight to be charged, it is necessary to firstly calculate RFR which depends on the type of transaction used in freight market, either freight contract or time charter. As mentioned in the pervious sub-section, the difference between these two types of transaction in freight market lies in "who pays what". The distribution of responsibility of cost incurred in ship operation based on the type of transaction can be seen in the Figure 2.6.

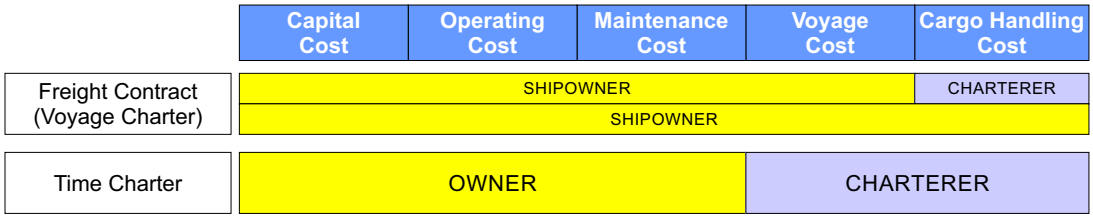


Figure 2.6: Costs Distribution on Freight Market Transaction

From charterer (cargo owner) point of view, the main objective to choose the selection of type of transaction is in order to make sea transport costs as minimum as possible. Therefore, the selection of the type of transaction should not only consider freight charged by shipowner, but also cost which is incurred and not covered in the transaction.

For example, in freight contract, there are two alternatives in which alternative 1 except cargo handling cost, all costs paid by shipowner, while in alternative

2 all costs paid by shipowner. In terms of freight charged by shipowner, alternative 1 is lower than alternative 2, but in alternative 1 cargo owner still have to pay cargo-handling cost. Therefore, in order to select the best alternative, cargo owner should calculate the unit cost, in which in alternative 1 unit cost is freight (charged by shipowner) plus cargo handling cost divided by total volume of cargo. Meanwhile, for alternative 2, the unit costs is freight divided by total volume of cargo.

2.2.5 Shipping Market in Indonesia

The implementation of cabotage principle in Indonesia has been delivering a big impact to the national shipping industry. According to Indonesian National Shipowners' Association (INSA), the number of Indonesian-flag vessels operated in domestic waters has dramatically increased by 320% from 6,041 units in 2005 to 25,352 units in 2016 (see in Figure 2.7).

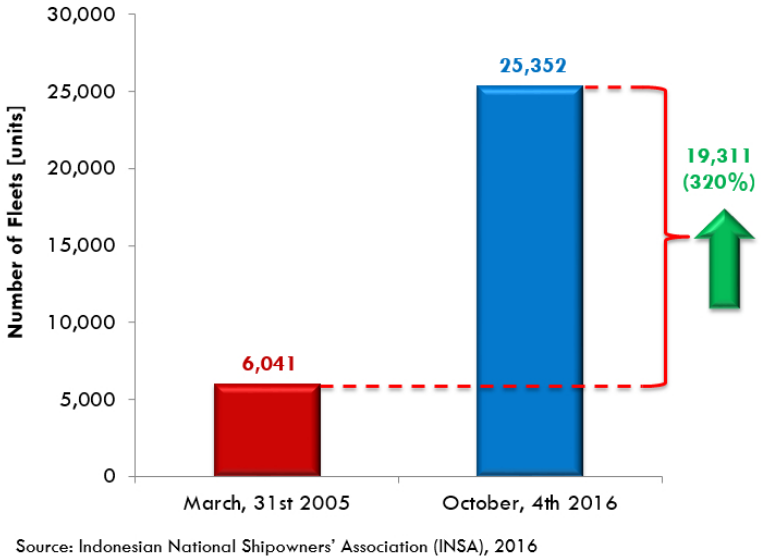
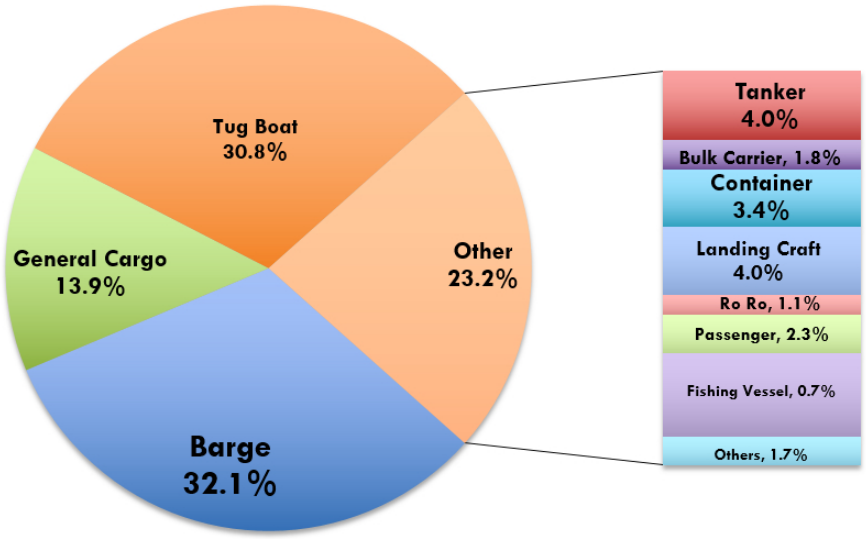


Figure 2.7: Increasing the Number of Indonesian-Flag Vessels

The number of Indonesian-flag vessels has grown up to 25,000 units, which proved that the cabotage principle has benefited on the national shipping industry. Based on the number of unit, we depict the composition of Indonesian-flag vessels that consist of general cargo, tug boat, barge, tanker, container ship, bulk carrier, etc.

The result shows that only three type of vessels dominate the shipping market in Indonesia, which are barge (8,128 units), tug boat (7,819 units) and general cargo (3,525 units). It presents that Indonesia has less number of Indonesian-flag vessels especially for container ship, tanker and bulk carrier. The detail of Indonesian-flag vessel composition by unit can be seen on Figure 2.8 as below:



Source: Indonesian National Shipowners' Association (INSA), 2016

Figure 2.8: The Composition of Indonesian-Flag Vessels by Unit

On the other hand, in term of ship capacity, barge has also dominated by 48.50% of total ship deadweight (44.96 million DWT) in 2016. Following that are tanker by 13.65% (6.13 million DWT), general cargo by 13.47% (6.06 million DWT) and bulk carrier 11.04% (4.96 million DWT). It can be concluded that shipping market in Indonesia has been dominated by barge, in term of unit and capacity. It proves that the availability of Indonesian-flag vessels particularly for cargo shipments is less to transport huge number of Indonesian export products.

3 Crude Palm Oil

This chapter deals with the evaluation of shifting ToD from FOB to CIF for crude palm oil (CPO) in particular. This chapter briefly explains an overview of palm industry in Indonesia, followed by the current market condition of CPO. Analysis of the current market condition will be conducted not only from supply side, but also from demand side. Analyzing from supply side will include the nature of the production, production capacity and the importance of CPO in term of export on the overall Indonesian export basket. Meanwhile, from the demand side, the global market share of Indonesian CPO will be elaborated as well as the main importing countries.

In the second part, we present the shipping market condition of CPO both in Indonesia and worldwide. Since there is a strong relationship between characteristics of commodity with ship design, then understanding on what types of ship commonly used is necessary in order to evaluate the shifting ToD easily. This section describes types and sizes of ships used to transport CPO, which will be used as a benchmark in the further calculation process.

In the third section, we evaluate the shift in ToD of CPO from FOB to CIF, which is the main substance of this chapter. The evaluation is conducted by comparing the existing ToD of CPO in FOB term with the calculated CIF term.

This chapter ends with concluding remarks containing a summary of the previous sections.

3.1 Commodity Market

3.1.1 Palm Oil Industry in Indonesia

Palm oil supply chain in Indonesia is divided into three industries: upstream, midstream, and downstream. Upstream industry covers all activities from plantation to cropped palm oil products, including Crude Palm Oil (CPO). Trading and transporting palm oil products are belong to midstream industry, while refining until producing the final product are parts of downstream industry.

The development of palm oil plantations in Indonesia has been started in 1960 and expanded rapidly in the following years. The growth rate of palm oil plantations has continued to rise by an average of 7.6% in the last 10 years [11].

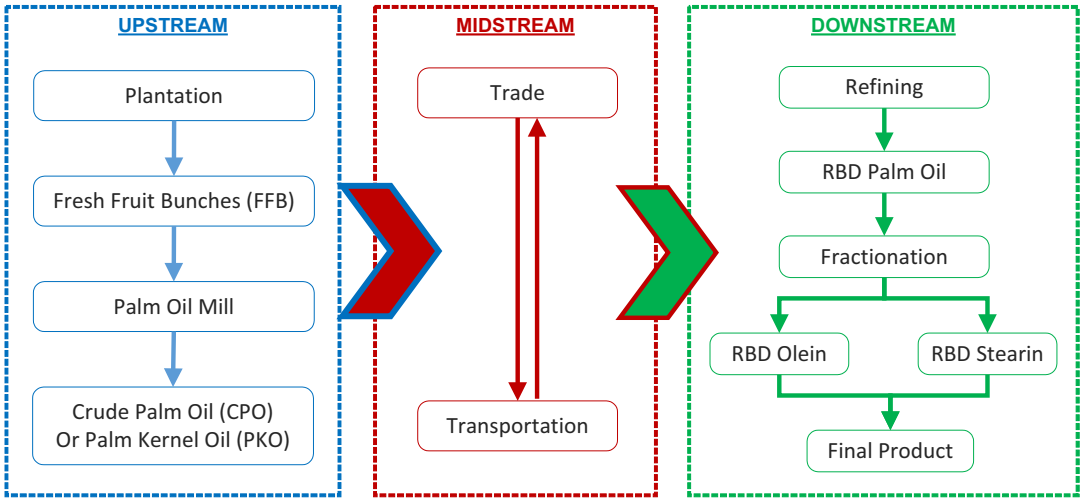
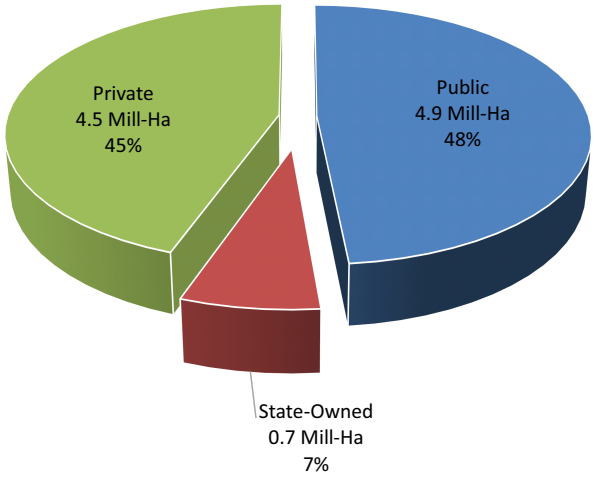


Figure 3.1: CPO Supply Chain in Indonesia

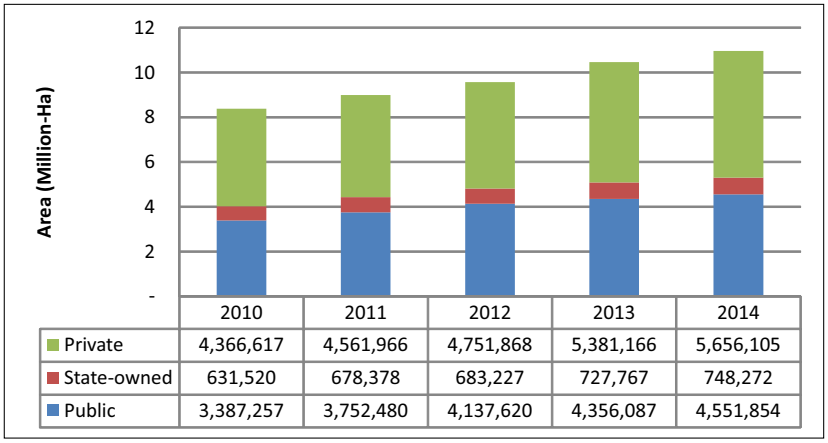
In terms of ownership, the palm oil plantations in Indonesia can be grouped into three categories, namely private-owned, stated-owned, and public farmers (smallholder). The distribution of the ownership of palm oil plantation can be seen in Figure 3.2.



Source: Modified from Directorate General of Plantation (2014)

Figure 3.2: Palm Oil Plantation in Indonesia, by ownership

The average growth of palm oil area in 2010 - 2014 was about 6.9% per year. The smallholder plantation have the highest growth with average 7.7% whereas private owned and state-owned have the average growth 6.7% and 4.4% respectively. According to the Directorate General of Plantation, the total area of palm oil plantation in 2014 was 10.1 million hectares.



	2010	2011	2012	2013	2014
Private	4,366,617	4,561,966	4,751,868	5,381,166	5,656,105
State-owned	631,520	678,378	683,227	727,767	748,272
Public	3,387,257	3,752,480	4,137,620	4,356,087	4,551,854

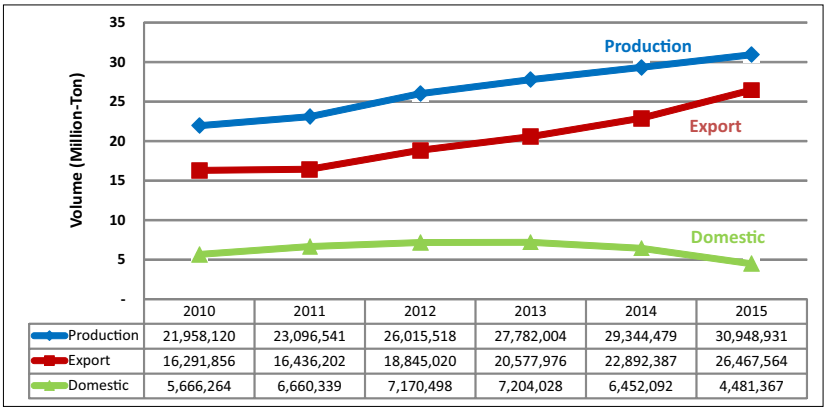
Source: Modified from Directorate General of Plantation (2014)

Figure 3.3: Growth of Palm Oil Plantation Area in Indonesia

3.1.2 Production of Palm Oil

Palm oil plantations in Indonesia are scattered in 22 provinces with the highest concentration in Sumatra with total area of 6.9 million hectares and thereafter in Borneo with total area of 3.4 million hectares and partly in Sulawesi, West Java, Banten, Maluku and Papua. In line with increasing in total area, the production also increased significantly.

Palm oil production in Indonesia can be classified into two categories, crude palm oil (CPO) and palm oil products. The growth of both palm oil production (CPO and palm oil products) in Indonesia from 2010 - 2015 can be seen in Figure 3.4. This figure shows that in 2010-2015 the total production of palm oil has been growth 7.1% per year.



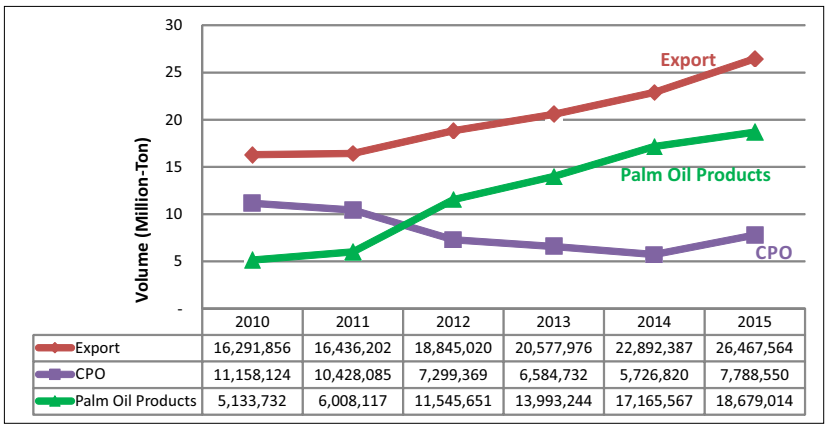
	2010	2011	2012	2013	2014	2015
Production	21,958,120	23,096,541	26,015,518	27,782,004	29,344,479	30,948,931
Export	16,291,856	16,436,202	18,845,020	20,577,976	22,892,387	26,467,564
Domestic	5,666,264	6,660,339	7,170,498	7,204,028	6,452,092	4,481,367

Source: Modified from Directorate General of Plantation (2015)

Figure 3.4: The Growth of Palm Oil Production and Consumption

From the total export of both CPO and palm oil products, 42.85% of them in average exported as CPO. In addition, the export of CPO has been declined in this period with the growth of -4.7% average per year, while export of palm oil

products growth with significant value of 32.4%. The growth of CPO and palm oil products in terms of volume can be seen in Figure 3.5.



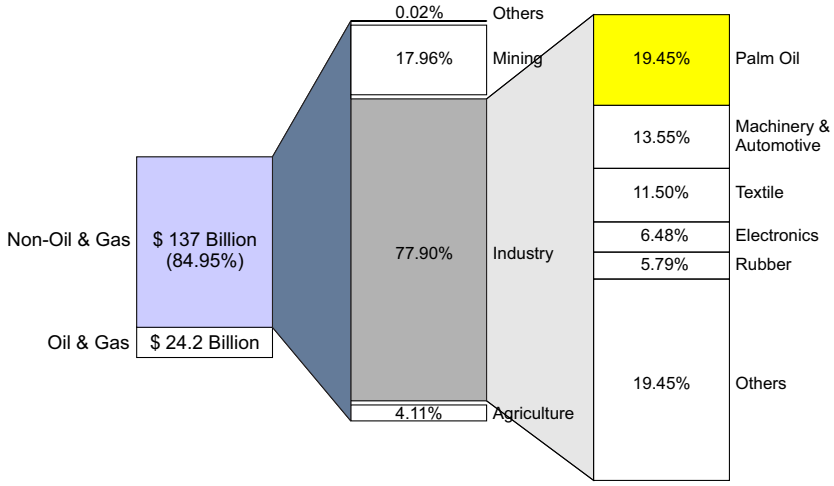
	2010	2011	2012	2013	2014	2015
Export	16,291,856	16,436,202	18,845,020	20,577,976	22,892,387	26,467,564
CPO	11,158,124	10,428,085	7,299,369	6,584,732	5,726,820	7,788,550
Palm Oil Products	5,133,732	6,008,117	11,545,651	13,993,244	17,165,567	18,679,014

Source: Modified from Directorate General of Plantation (2015)

Figure 3.5: Comparison between Palm Oil Export and CPO Export

3.1.3 Indonesian CPO Export

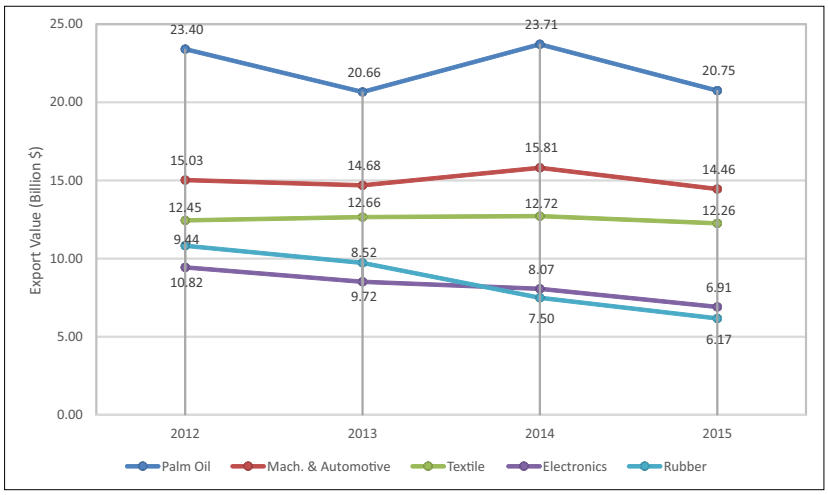
Indonesian export products can be classified into two main sectors, oil & gas and non-oil & gas. With the total value of export more than $161 billion in 2015, the contribution of oil & gas was 15% and non-oil & gas was 85%. Palm oil product belongs to the non-oil & gas sector with total value of export in 2015 was $20.7 billion which represented 12.87% of the total Indonesian export basket. The importance of palm oil on the overall Indonesian export basket can be seen in Figure 3.6.



Source: Modified from Directorate General of Industry (2015)

Figure 3.6: Indonesian Export Commodities by Sectors (billion $)

Furthermore, palm oil products was the leading Indonesian export product, which gained the highest value during 2012 - 2015, even though the trend slightly decrease by 3% in average. The growth of export value of top five Indonesian export products can be seen in Figure 3.7.



Source: Modified from Directorate General of Industry (2015)

Figure 3.7: Top Five Indonesian Export Products

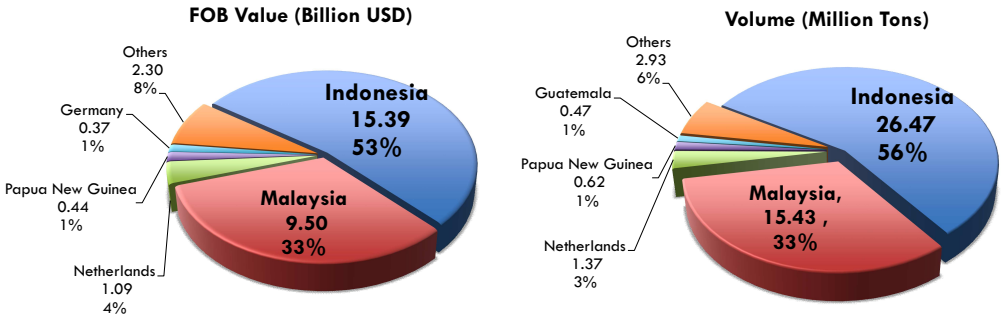
On the other hand, the contribution of palm oil products on the total export basket of Indonesia has slightly different in terms of volume. Based on the Central Bureau of Statistics, total Indonesian export volume in 2015 was 509.6 million ton. Meanwhile, total export of both CPO and palm oil products was 26.47 million ton (see Figure 3.5), meaning that the contribution of bot CPO and palm oil products on the total Indonesia export basket was 5.2% with distribution where CPO contribute 1.5% and palm oil products was 3.7%.

3.1.4 Global Market Share

As mentioned in the previous sub-section, the total volume of both CPO and palm oil products in 2015 was 26.47 million tons. According to International Trade Center (ITC), this value represented 56% of world's total demand and recorded as the largest exporter. Meanwhile, Malaysia was on the second position by amounting to 15.43 million tons or 33% of world's demand. Followed by the Netherlands, Papua New Guinea, and Guatemala.

In addition, Indonesia also ranked on the top supplier in terms of export value (FOB prices), where Indonesia dominated by US$ 15.39 billion, which represented 53% of the total world's demand by 29.1 billion US$ in 2015. Meanwhile, Malaysia was on the second by 9.5 billion US$ (33%).

The global market share for both CPO and palm oil products in 2015 in terms of value (FOB prices) and volume can be seen in Figure 3.8.



Source: Modified from International Trade Center (2015)

Figure 3.8: Global Market Share of Palm Oil Products in 2015

The Netherlands becomes the world's 3rd largest exporter of palm oil products, even it is not a producer country, because its palm oil export is re-export. In addition, from 2012 to 2014 Indonesia's market share has been increasing from 46% to 50%, so it has proven that Indonesia has a strong position as major supplier of palm oil.

Since the scope of works of this study is CPO, from this section onward, we will focus on the global market share for CPO only as one of the potential palm oil products. In line with the global market share of palm oil products, there are top three world's exporter countries of CPO, such as Indonesia, Malaysia and Papua New Guinea [9]. Following that, Guatemala and Colombia are the potential exporter countries. The total world's CPO volume diminished by 21% in 2014 but it fortunately grew up by 18% in 2015. Afterwards, the total CPO volume of top five exporter countries from 2013 to 2015 is presented as below:

Table 3.1: Top Five Exporting Countries

Exporter	2013		2014		2015	
	Vol (ton)	%	Vol (ton)	%	Vol (ton)	%
Indonesia	6,584,732	41.0%	5,726,820	45.2%	7,788,550	52.0%
Malaysia	3,963,186	24.7%	4,619,337	36.4%	5,445,708	36.3%
Papua New Guinea	516,364	3.2%	505,290	4.0%	545,168	3.6%
Guatemala	332,818	2.1%	372,177	2.9%	431,373	2.9%
Colombia	140,921	0.9%	199,265	1.6%	351,396	2.3%
Others	4,511,644	28.1%	1,259,799	9.9%	420,018	2.8%
TOTAL	16,049,665	100.0%	12,682,688	100.0%	14,982,213	100.0%

Source: Modified from Central Bureau of Statistics of Indonesia (2015)

Papua New Guinea, Guatemala and Colombia are CPO producer countries that should allocate more production in order to meet both export and domestic needs. On the other hand, Indonesia is known as the most efficient country in producing palm oil so that Indonesian CPO could be more competitive in the international market.

3.1.5 Port of Export

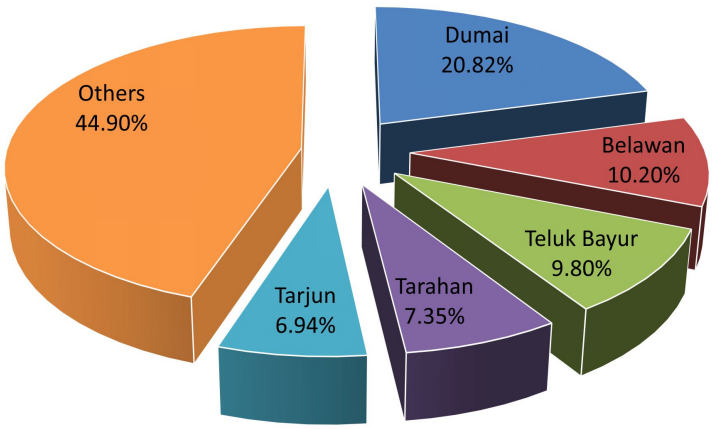
According to Central Bureau of Statistics (2016), Indonesia's largest palm oil processing are located in Sumatra and Kalimantan. Therefore, top five ports that serve CPO export are also located in these islands. In 2015, the total number of shipments from these top five ports was 135 out of 245 total shipments, which represented 55.1%. These top five ports of export can be seen in Table 3.2.

Table 3.2: Ports of Export for Indonesian CPO by Shipment

Name of Port	Province	Shipments	%
Dumai	Riau	51	20.8%
Belawan	North Sumatra	25	10.2%
Teluk Bayur	West Sumatra	24	9.8%
Tarahan	Lampung	18	7.3%
Tarjun	South Kalimantan	17	6.9%
Others	-	110	44.9%
TOTAL		245	100.0%

Source: Central Bureau of Statistics of Indonesia (2016)

In 2015, Riau was the largest exporter of CPO through port of Dumai, which reached 20.82% or 51 shipments out of 245 shipments. North Sumatra ranked the second position through Port of Belawan, which achieved 10.2% or 25 shipments. More detail about the proportion of main port for CPO export can be seen in Figure 3.9.



Source: Modified from Central Bureau of Statistics of Indonesia (2016)

Figure 3.9: The Proportion of Main Ports of Export

3.1.6 Main Importing Countries

Based on the Central Bureau of Statistics (2016), in terms of export volume in 2015, the main importing countries for Indonesian CPO are India, the Netherlands, Malaysia, Singapore and Spain (see in Table 3.9).

Table 3.3: Importing Countries of Indonesian CPO by Volume

Importing Country	Volume (thousand tons)	%
India	3,820	49.1%
Netherlands	1,044	13.4%
Malaysia	622	8.0%
Singapore	605	7.8%
Spain	581	7.5%
Others	1,116	14.3%
TOTAL	7,788	100.0%

Source: Central Bureau of Statistics of Indonesia (2016)

In terms of volume, Malaysia is the world's 2nd largest producer of palm oil and the 3rdbiggest importer of CPO at the same time. This is because majority of Indonesian palm oil companies are subsidiaries of companies in Malaysia. Meaning that Malaysia plays the same role as the Netherlands, which is re-exporter of Indonesian CPO, even though it basically has a large palm oil plantation. Hence, it affects on the Malaysia's status on the International CPO trading, because it can be either as exporter or importer simultaneously.

3.1.7 Existing Terms of Delivery

The following scheme presents the implementation of Incoterms in Indonesia for CPO product in particular by some of the largest palm oil companies in Indonesia.

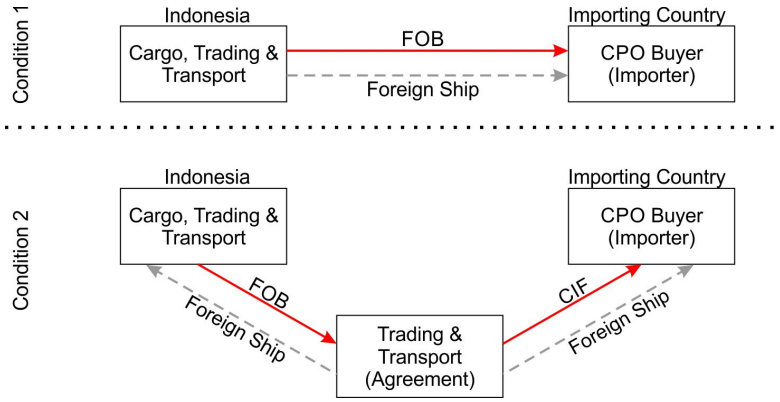


Figure 3.10: The Implementation of Incoterms for Indonesian CPO Export

Figure 3.10 depicts the trading agreement (sales contract) between the seller and buyer going abroad as the center of the company. The explanations regarding two conditions above are as follows:

- Condition 1
  When Indonesia plays a role as a seller and directly delivers the export products to importing country as an end user. Under this condition, Indonesia could manage all kinds of purpose, including the cargo (CPO), trading (documentation) and transport (vessel). However, Indonesian CPO exports are currently operated by foreign vessels under a FOB regime.
- Condition 2
  Under this condition, Indonesia merely plays a role as a provider of CPO, but the trading and transport are managed by other country, in this case Malaysia or Singapore. It means that Singapore or Malaysia acts as re-exporter of Indonesian CPO, so that trading CPO from Indonesia to Singapore/ Malaysia uses FOB term and foreign vessels. Conversely, Indonesian CPO from Singapore/ Malaysia would be re-exported by applying CIF term and might be transported by Malaysian or Singaporean-flag vessels.

Both conditions can be applied on the CPO trading. However, it depends on who will be the importing countries. If they are Singapore, Malaysia and the Netherlands, it means that they will act as re-exporter instead of end buyer.

3.2 Shipping Market

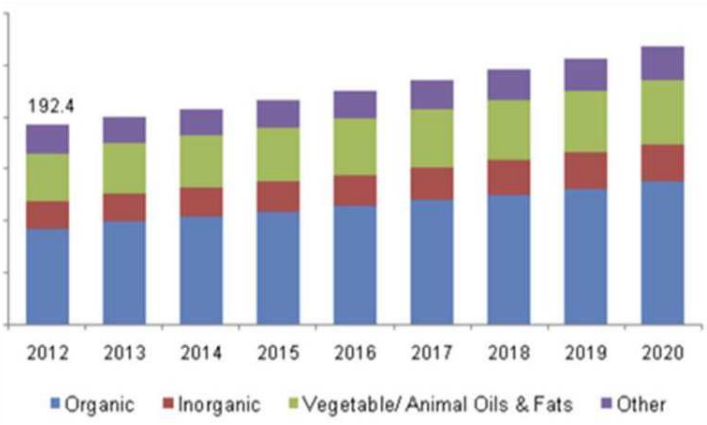
There is a strong correlation between characteristics of commodities (including packaging) transported and the ship design. In other words, the type of ship depends on the type of cargo carried. Even though basically all type of ships can transport any kinds of commodities, but in order to achieve transport efficiency, the specific type of ships is required.

For example, general cargo ships or container ships can transport CPO by replacing it into drums. These alternatives can be done if the volume for one shipment in a small volume. However, if the volume for one shipment is huge (in bulk), then using specialized ship is more efficient. Since all of CPO export always shipped in (liquid) bulk and transported using chemical tanker, then evaluation of shipping market in this section will focus on the bulk shipping industry.

3.2.1 Ship Type

As already stated in Section 2.2, the type of ships commonly used to transport CPO belongs to the sub-group of chemical tanker under the group of tanker. Furthermore, there are several division of chemical tanker based on the cargo carried, namely organic, inorganic vegetables/ animal oil and fats.

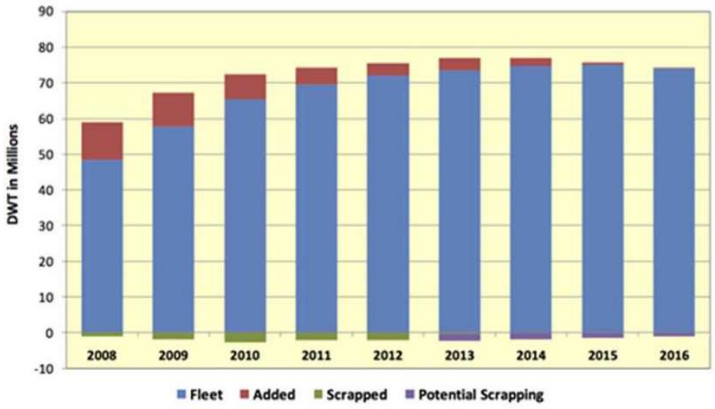
On the basis of products, organic chemical is the largest commodity transported with chemical tanker with the rapid demand in the industry. On the other hand, vegetables/ animal oil and fats has its own market share due to increased health problems, including a positive impact on demand for palm oil and soybean oil. An inorganic chemical is expected to remain stable in the market. Demand and forecast of chemical products up to 2020 can be seen in Figure 3.11.



Source: Grand View Research, Chemical Tanker Analysis

Figure 3.11: Demand and Forecast of Chemical Products

In terms of number of ships used, global chemical tanker market reached 192,4 million tons in 2012. Rising demand from emerging economies and rising GDP has brought the development of the global chemical industry. The chemical tanker market has experienced growth around 20.5% between 2008 - 2012. However, the operation of chemical tanker is high risk, therefore, restrictions and regulations to protect environment have been rising. The global chemical tanker trend can be seen in Figure 3.12 below:

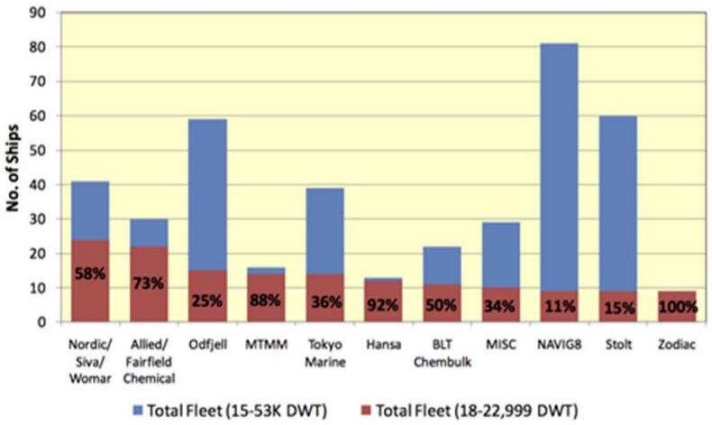


Source: www.spimarinesia.com (2012)

Figure 3.12: Trend of Global Chemical Tanker

The market structure of global chemical shipping is oligopoly. This is indicated by the fact that 11 shipping companies (operators) control more than 52% of

the chemical tanker market worldwide. These companies that are extremely dominating the chemical tanker market are illustrated in Figure (3.13).



Source: www.spimarinesia.com (2012)

Figure 3.13: Global Operators of Chemical Tanker

As we can see from this figure, one of the global operators is Indonesian company, that is PT. Berlian Laju Tanker (BLT). However, BLT is now unable to compete in chemical transportation market anymore.

3.2.2 Indonesian Fleet Availability

One of the objectives of this study is to evaluate the availability of Indonesian fleet to potentially offer the service to replace foreign-flag ships. Therefore, we presented the availability of Indonesian fleet for chemical tanker.

According to the Ministry of Transportation, there are 550 Indonesian-flag tankers in 2011. Yet, 303 units or 55.1% of total tankers are not identified by size. We used AFRA scale to classifies tanker based on the deadweight of ship (DWT). Based on the AFRA scale, the population of total tanker in Indonesia is shown in Table (3.4):

From Table (3.4) we can see that majority of Indonesian-flag tankers are relatively small in size (mostly are Handysize). The population of this size is 205 ships or 37.3% of total tanker population. In addition, out of 505 units mostly are oil tankers (product oil), which are not suitable to transport CPO.

According to the Ministry of Transportation, the number of Indonesian-flag chemical tankers (which is suitable for CPO) is only 22 units (4%) as can be seen in Figure (3.14). Furthermore, from the total Indonesian-flag chemical tankers are mostly used for domestic transport. This condition indicates that for export purposes, Indonesia is still lack of chemical tanker especially for transporting CPO.

Table 3.4: Number of Indonesian-Flag Tanker by Size

AFRA Scale	Size in DWT	Unit	%
Handysize	up to 10,000	205	37.3%
General Purpose Tanker	10,000 - 24,999	16	2.9%
Medium Range Tanker	25,000 - 44,999	16	2.9%
Large Range 1	45,000 - 79,999	2	0.4%
Large Range 2	80,000 - 159,999	6	1.1%
VLCC	160,000 - 319,999	2	0.4%
ULCC	320,000 and over	0	0.0%
Unknown	Unknown	303	55.1%

Source: Directorate of Seaborne Traffic (2011)

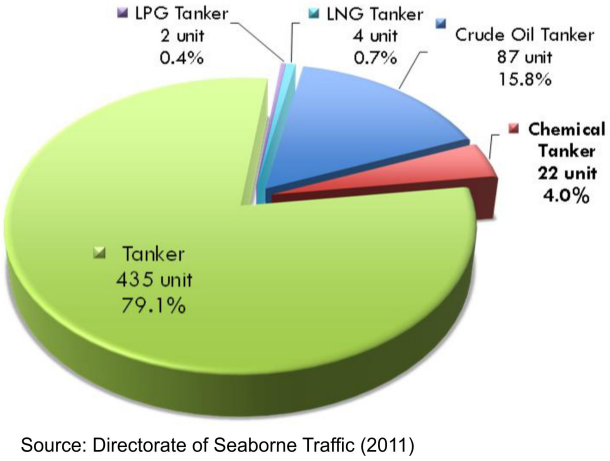


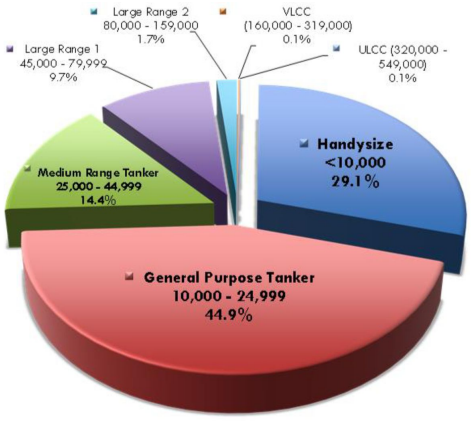
Figure 3.14: Proportion of Tanker Ships in Indonesia

3.2.3 Shipments of Indonesian CPO

According to Ministry of Transportation, in 2011 there were 1,478 shipments of CPO export, where 672 shipments (45%) were transported by General Purpose Tanker, followed by Handysize Tanker with 406 shipments. The proportion of Indonesian CPO shipment by size of ships can be seen in Figure (3.15).

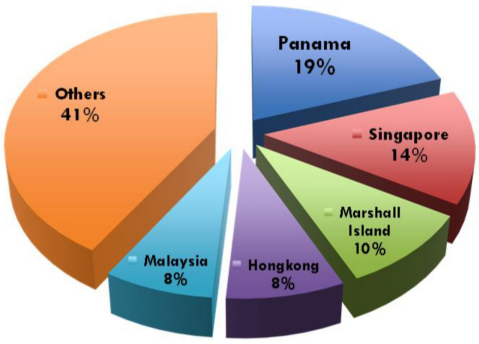
In terms of flag states, there are five biggest flag states of tankers used for Indonesian CPO export. This big five of flag states of tankers are Panama, Singapore, Marshal Island, Hongkong and Malaysia. The proportion of flag states of chemical tanker for Indonesia CPO export can be seen in Figure (3.16).

From the big five flag states, there are two countries that implement Flag Of Convenience (FOC), which is closely related to open registry term. These two countries are Panama and Marshal Island with the total proportion of 29% of total ships used. FOC is a condition where a ship is registered in a country other than of the ship's owner.



Source: Directorate of Seaborne Traffic (2011)

Figure 3.15: Shipment of Indonesian CPO by Size of Ships



Source: Directorate of Seaborne Traffic (2011)

Figure 3.16: The Big Five Flag States for Indonesian CPO Export

Owners of a ship may register the ship under a FOC to reduce operating costs or avoid the regulations of the owner's country. In other words, owner with the FOC ships can offer the lower price compare to non-FOC ships.

3.3 Evaluation of Shifting ToD

3.3.1 Basic Calculation

The Terms of Delivery (ToD) used in every transaction of trade is totally depending on the bargaining position of buyers or sellers. Those who have a higher bargaining position will tend to determine the terms used in order to control the whole process of transactions. The decision to choose particular terms used highly relies on several variables ranging from price, quality and trust.

As already stated in Section 3.1, CPO is always shipped in (liquid) bulk, therefore, evaluation of shifting ToD is conducted by applying common characteris-

tics of bulk shipping.

Based on the standard rules in Incoterms (see Section 2.1) the division of responsibility between sellers and buyers in FOB term and CIF term can be seen in Figure 3.17. From this figure, we can see that there is no difference in the way to calculate the freight.

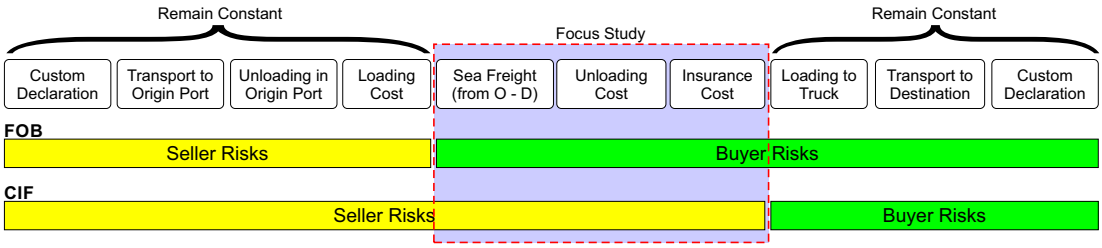


Figure 3.17: Seller and Buyer Responsibilities in FOB and CIF

The Figure 3.17 also shows that costs in which this study will focus on are **sea freight**, **unloading cost** and **insurance cost**. The unloading cost is to remain constant whether in FOB or CIF, since it depends on the port tariff, which are not directly related to the terms used. Meanwhile, the insurance cost is market driven and will not calculate in detail. The only cost that will be calculated and to be compared is sea freight.

We used one route taken from one of the biggest CPO exporter in Indonesia in this basic calculation. The route selected as a case study is from Port of Selabak, Kalibaru, South Kalimantan to Port Klang, Malaysia with the total distance of 1,315 nautical miles as seen in Figure 3.18 below.

Figure 3.18: Selected Route of CPO for a Case Study

Based on the information gathered from the interview with the one of the biggest exporter in Indonesia[1], CPO from South Kalimantan to Port Klang is mostly shipped by chemical tanker with the size of about 3,000 DWT and payload capacity of 2,700 tons. The freight in the past year has been fluctuated ranging from $26 - $30 per ton where the current freight is $26 per ton. It should be noted that this freight is consisting of sea freight and unloading cost for the transaction of voyage charter for one voyage.

Further details of the data for CPO export from the company we interviewed that will be used as the basis for the further calculation, can be summarized as follows:

1. **Port of Origin**

   Port of Selabak is a private owned port which is dedicated port for CPO located in Sungai Durian, South Kalimantan. The main facilities and equipments of port of Selabak can be seen in Table 3.5 below:

Table 3.5: Port of Selabak Main Facilities

Port Facilities	Specifications	Unit
Harbor type	Jetty - River natural	
Depth	6.0 - 8.1	mLWS
Max DWT	8.000	tons
Dolphin berths	1	unit
Type of loading/unloading	piping	
- Productivity	100	tons/hour/pipe
- No of pipe	2	unit
Storage Tank		
- No of Tank	3	unit
- Capacity	2,000	tons/tank

2. **Port of Destination**

   Port of destination in this case study is Port Klang, Malaysia. As the largest port in Malaysia, Port Klang is located in several locations, North, South and West Port. The terminal dedicated for CPO is located in West Port with the following main facilities and equipments:

[1]As per company requested, the company name is not mentioned in this report

Table 3.6: Port Klang Main Facilities

Port Facilities	Specifications	Unit
Harbor type	Liquid Bulk with pipelines	
Depth	10.0 - 16.1	mLWS
Max DWT	40.000	tons
Dolphin berths	5	unit
Berths length	1,361	m
Type of loading/unloading	piping	
- Productivity	100	tons/hour/pipe
- Unit pipe	2	unit

3. **Ship specification**

   As already mentioned, the ship used in this case study is based on the information we had during the interview with the company. This ship is a chemical tanker with the type of freight transaction is freight contract (voyage charter) for one voyage. The specifications of this ship is shown in Table 3.7 below

Table 3.7: Ship Specification in the Case Study

General Information	
Tipe	MT. TIEN THANH 26
Year Built	November 2010
Builder	Vietnam
Flag	Vietnam
Classification	Vietnam
DWT	**2,952** ton
LWT	1,107 ton
Payload	2,686 ton
Gross Tonnage (GT)	1,879 ton
Main Dimension	
Length Over All (LOA)	79.6 m
Length Between Perpendiculars (LBP)	74.7 m
Breadth Moulded (B)	12.8 m
Moulded Depth (H)	6.1 m
Draft (T)	5.1 m

Service Speed (Vs)	
Ballast Speed	12.0 Nm/hour
Laden Speed	10.2 Nm/hour
Power Engine	
Main Engine	1468 kW
	1 unit
Aux. Engine	291 kW
	3 unit
Specific Fuel Oil Consumption (SFOC)	
Main Engine (DO)	192 g/kWh
Auxiliary Engine (DO)	201 g/kWh
Specific Lube Oil Consumption (SLOC)	
Main Eng & Aux. Eng	0.8 g/kWh
Commision Days	330 days/year
Crews	20 person

4. **Freight Information**

   The freight information based on the interview, which will be used as a benchmark in further calculation is shown in Table 3.8as follows:

As already mentioned in Section 2.2 that in the transaction of sea transport services always involves at least two parties, shipowner and shipper (cargo owner). In the transaction of trade between sellers and buyers, both parties can act as a cargo owner depending on the ToD used. In a FOB term, the cargo owner is the buyer of CPO, whereas in a CIF term the cargo owner is the seller.

After knowing the existing condition of the ToD, freight, ship specifications and freight transactions as mentioned in the previous items, then we have to verify

Table 3.8: Freight Information for Base Calculation

Item	Remarks
Freight	$26/ton including unloading cost
Unloading cost	$2.4/ton
Sea Freight only	$23.6/ton
Freight Transaction	Voyage charter for one voyage ⇒ mean that the freight only for one way
Insurance	unknown

the information by calculating the costs incurred by the shipowner. The aim of this verification is to obtain the estimated costs of the sample ship, which will be used as a basis for further calculation when freight estimation of different route, different ship, and different volume of CPO is required.

Verification of Freight

As seen in Table 3.8 that the freight of US$26/ ton includes unloading cost, where the unloading cost is US$2.4/ ton, and the freight only is US$23.6/ ton. In this verification, we need to calculate the estimated shipping costs so that the freight is equal to US$23.6/ ton for one voyage. In order to do this, we have to categorize the shipping costs into two groups, fixed costs and variable costs. Fixed costs are consisting of capital cost, operating cost and maintenance cost, while variable costs consist of voyage cost and cargo handling cost. The methodology we used to calculate these costs is as follows:

1. **Capital Cost**

   Capital cost is the cost to finance the ship which depend on how the ship has been financed and the ship price. Since the price information of the ship is not available, then we collect ship price data of the same ship type from different sources. The ships are in various size and DWT. Furthermore, by applying regression method; we can correlate the ship price and DWT of the ship.

   From the equation we have generated by applying the regression method, then we estimate the ship price used in this case study. For 5-year-old ship and by assuming of 25 years of economic life, the ship price is estimated by US$ 8,346,036.

2. **Operating Cost**

   Operating costs constitute the expenses involved in the day-to-day running of the ship. These costs consist of crew wages, stores and supplies, lubricants, insurance and administration cost. In order to calculate these costs, we use assumptions as follows:

a) Number of crews is 20 persons with average salary of US$ 1,921/ person/ month.

b) Stores and supplies are a function of the number of crews and their provision per day, which is assumed to be US$7.60/ person/ day.

c) Lubricating cost depends on the specific lubrication oil consumption, which is contained in the ship specifications (see Table 3.7).

d) Insurance cost is assumed to be 1% of the ship price.

e) Administration cost is assumed to be 5% of the total operating costs.

3. **Maintenance Cost**

   Maintenance cost is a cost to maintain the ship, which can be divided into two categories. First is an annual maintenance, which is assumed to be 1% of the ship price. Second is a special survey every 2 years, which is assumed to be 4% of the ship price.

4. **Voyage Cost**

   Voyage costs are variable costs associated with a specific voyage consisting of fuel cost (main engine and auxiliary engine) and port cost. Fuel cost depends on the fuel consumption of the engine, which is contained in the ship specifications (see Table 3.7) and fuel price. Meanwhile, port costs particularly for both port of origin and port of destination are as follows:

Table 3.9: Port and Cargo Handling Charges in Port of Selabak

Description	Unit	Value
Anchoring	US$/GT	0.115
Mooring	US$/GT	0.110
Pilotage	-	-
- Fixed tariff	US$/movement	109
- Variable tariff	US$/movement	0.04
Tugboat	-	-
- Fixed tariff	-	-
(2,001 - 3,500 GT)	US$/movement	200
(3,501 - 8,000 GT)	US$/movement	563
(8,001 - 14,000 GT)	US$/movement	851
- Variable tariff	US$/movement	0.01
Cargo Handling Cost	US$/Ton	2.25

5. **Cargo Handling Cost**

   Cargo handling cost is a cost incurred when the ship is loading or unloading. The cargo handling cost depends on the type of cargo handled, type of cargo handling equipment and port policy. This cost is not calculated in this validation process since this cost is remaining the same regardless the ToD used.

Table 3.10: Port Charges and Cargo Handling Charges in Port Klang

No.	Description	Unit	Value	Remark
1	Port Dues	US$/100 GT	1.44	76 GT < ships size < 35,000 GT
2	Quay Dues	US$/100 GT	1.44	120 hours < duration < 240 hours
3	Consolidated Marine Charge	US$	720	Not exceed 100 meters
4	Pilotage Service	US$	0.72	per m LOA per movement
5	Tugboat Service	US$	2.28	per LOA per movement
6	Cargo Handling Charge	US$/ ton	2.4	Foreign going ships

Source: http://www.westportsmalaysia.com/Conventional-@-Conventional_Tariff.aspx

After calculating the fixed costs as mentioned in the previous items, the next step is the calculation of the voyage charter hire by calculating all fixed costs for the rest of economic life of the ship. All costs are assumed to be increased by 6% every year. By having all fixed costs for the rest of economic life of the ship, we can calculate the annuity of these costs in order to estimate the voyage charter hire.

By assuming that WACC (weighted average cost of capital) of 11.7%, the annuity of this ship is US$1,920,880. By dividing this annuity of the fixed costs by commission days per year - which assumed to be 330 days - can be obtained the net voyage charter hire per day. By assuming that the profit of the shipowner is 10%, then the estimated voyage charter hire is US$ 6,721/ day.

The next step is calculation of the voyage cost for one voyage (one way) since the information that we have to verify is for one voyage only. In order to calculate this cost, we need to understand how long one voyage takes place, where it can be calculated based on sea time and port time. Sea time depends on the distance and speed of the ship, whereas port time is depending on the operational time of the ship in port (such as waiting time, approaching time and idle time) and loading/ unloading time.

By assuming that operational time of the ship in port (not including loading/ unloading time) is 8 hours and 7 hours for port of origin and port of destination respectively, and based on the specifications of the ship (see Table 3.7), main facilities of ports (see Table 3.5 and 3.6), and port charges (see Table 3.9 and 3.10), then for one voyage we have results as follows:

From Table 3.11 above shows that calculated freight is US$26.43/ ton. The error of calculated freight with the data freight of US$26/ ton is only 1.6%. Since this error is relatively small, we are quite confident to use the calculation method in this study for further calculation.

Table 3.11: Calculated Freight for One Voyage

Description	Unit	Value
Voyage Time	days	7.00
Cargo Carried	tons/voyage	2,687.00
Voyage Charter	US$/day	7,082.00
	US$/voyage	56,659.00
Fuel Cost	US$/voyage	5,818.00
Port Dues Origin	US$/voyage	900.00
Port Dues Destination	US$/voyage	1,102.00
Unloading cost	US$/voyage	6,446.40
Fresh Water	US$/voyage	70.00
Total Freight	US$/voyage	70,995.51
	US$/ton	26.43

3.3.2 Further Calculation

Based on the calculation method as mentioned in the previous sub-section where the error is relatively small, we used the same method in further calculation. In this sub-section, we presented what-if scenario of the CPO export when the shifting ToD from FOB to CIF is applied.

As already mentioned, the calculated freight in the previous sub-section is for one voyage only with the shipment volume of 2,687 ton of CPO. In this sub-section we are going to estimate what will happen if the Indonesian CPO export conducted in different way and shipped by Indonesian-flag ships. In order to do this calculation, we still use the same company with the same route, but with different scenarios of shipment.

Based on the data from the company we used as a case study, the total export of CPO of this company in 2015 was 175,342 ton/ year. By using this volume for one year, then we developed scenarios of shipment based on the total volume for one year instead of for one voyage by using the same type and size of the ship. The scenarios of shipment are grouped into two groups based on the type of freight transactions, as follows:

- Voyage Charter
  In this scenario, the contract of shipment is conducted based on the total volume for one year by using voyage charter scheme. In other words, the cargo owner (in this case the seller of CPO, since it is a CIF term) buys sea transport services from the shipowner for one year, instead of one voyage. In this case, the cargo owner does not wish to become actively involved as an transport operator.
- Time Charter
  In this scenario, the cargo owners (the seller of CPO, since it is a CIF term) hire ship(s) for a certain period and prefer to manage the transport by themselves.

Scenario 1: Voyage Charter

In this scenario, it is assumed that the contract to transport the CPO between the cargo owner (CPO seller, since it is CIF term) and the transporter (shipowner) is done in one-year period. In the voyage charter contract, the transport management is under shipowner responsibility.

Since the objective of the development of the scenario is to analyze the possibility of shifting the ToD from FOB to CIF, then in order to make an apple-to-apple comparison, the volume of CPO transported and specification of ship used is similar to the current condition (see Section Basic Calculation).

The freight in this scenario is calculated based on one-year voyage charter contract with a specific demand of export for one year (175,342 tons/ year). Under these conditions, the required frequency of ship to transport the cargo is 66 times/ year (by dividing the demand of export for one year with ship's capacity), whereas the frequency of one ship is 29 times/ year (by dividing commission days in one year with one round-trip days). Therefore, it is required three ships to transport the specific demand of export for one year.

Furthermore, the total freight is calculated by multiplying the total frequency with all component costs per trip. The result of freight in this scenario is US$6,038,480/ year or US$34.44/ ton.

Scenario 2: Time Charter

Scenario 2 is conducted to find out other alternatives of freight under time charter contract. The main difference between Scenario 1 and Scenario 2 is the charter period. A voyage charter is hiring a vessel based on the frequency delivery of goods and specifications of the ship that is used for one-year period. Meanwhile, a time charter is hiring a vessel by CPO seller (which is act as the shipowner) based on whole one-year period (365 days). Basically, to avoid volatility in voyage (spot) charter, shipowners may use the period of time charter to control the costs, as they are protected from the freight rate fluctuations, which are a feature of 'spot' market trading.

With the same calculation method as previous scenario, the required frequency of ship to transport the cargo is 66 times/ year and the frequency of one ship to transport the demand is 29 times/ year. Thus, we need three ships to be chartered for one-year period. Then the total freight for one year can be obtained, yet there is one difference on how to calculate the freight. On this scenario, the total freight is calculated based on fixed costs and variable costs.

Fixed cost is calculated by multiplying one-year period (365 days), time charter hire per day and the amount of the ship (three ships). Meantime, variable costs are calculated by multiplying the total frequency for one year with variable costs (fuel, port charges, fresh water and cargo handling cost) incurred per trip. Therefore, the result of total freight in this scenario is US$7,403,604/ year or US$42.22/ ton.

If we compare these two scenarios, the freight on time charter is greater than freight on voyage charter. The freight difference is caused by two reasons. First, ship utilization on time charter is 71% (not optimal) because the export volume is fewer than the payload capacity of the ship, whereas the ship utilization under voyage charter is 100% to carry the export volume. Second, shipowner (CPO seller) on time charter should bear all ship's costs including during ship's non-operating time in one-year period, while shipowner on voyage charter only bear the ship's costs based on the required frequency to transport all cargoes.

Potential Freight for Indonesian Shipping Services

Potential freight means estimated freight for Indonesian shipping services from export transaction regardless the terms of delivery that is used (either with FOB or CIF terms). This section provides estimated freight of CPO export shipments from the five biggest importing countries, which is India, the Netherlands, Malaysia, Singapore and Spain.

In order to define the potential freight, it is necessary to firstly understanding the type of shipping charter to deliver the cargo. The main actor to determine the type of shipping charter is shipowner (CPO seller in a CIF term). In reality, shipowner will not always choose one type of ship to transport its cargo, either only voyage charter or only time charter. However, shipowner will combine the use of voyage charter and time charter to produce an optimal freight.

The selection of time charter depends on several circumstances. First, when the contract volume of delivered cargo is a long-term period. Second, the shipowner should have competency to manage the transport system (also act as a cargo transporter). Third, the volume of delivered cargo is suitable with ship's specification to be chartered (when ship utilization is optimal).

On the other hand, voyage (spot) charter will be selected under several circumstances. First, the contact volume of delivered cargo could be a short-term or long-term contact. However, the voyage charter is commonly used to transport volume of cargo with short-term contract (less than one year). Second, shipowner does not have competency to be a cargo transporter (only act as a CPO seller).

From the explanation above, the potential freight is calculated under time charter and voyage charter contracts. It is assumed that fixed costs consisting of capital cost, operating cost and maintenance costs and variable costs consist of voyage costs and cargo handling cost are similar with basic calculation assumption (see Sub-section 3.3.1). Meanwhile, the distance depends on the length between port of origin is Port of Dumai, Riau, Indonesia and port of destination on every importing country. The potential freight is calculated both under voyage charter contract and time charter contract. One-way voyage is not calculated because the ballast leg depends on the location of the ship in the spot market, which is out of the study scope. Therefore, the result of potential freight

for two scenarios is as follows:

Table 3.12: Potential Freight for CPO in Voyage Charter and Time Charter

No.	Importing Country	Freight (US$/year)	
		Voyage Charter	Time charter
1	India	103,554,927	97,850,407
2	Netherlands	73,460,679	69,321,968
3	Malaysia	8,821,322	10,043,252
4	Singapore	8,158,181	8,079,042
5	Spain	35,868,025	32,126,457
Total		**229,863,134**	**217,421,126**

Table (3.12) shows estimated potential freight for both voyage charter and time charter. This means that Indonesian shipping companies have a potential freight ranging from US$217,421,126 to US$229,863,134 in 2015. This estimated freight presents about 86% of the total volume of CPO export and represents approximately 5% of the total FOB value, which consists of CPO price, freight and insurance.

This potential freight for CPO indicates that Indonesian shipping service has an opportunity to serve these export shipments, yet shifting the ToD from FOB to CIF should firstly look at the readiness of the national fleets (Indonesian-flag fleets) in term of the quantity, quality, compatibility and reliability. Based on the analysis, national shipping companies must have at least 536,000 DWT (32 units of various size of chemical tanker) to serve the five biggest importing countries of Indonesian CPO.

According to Indonesia Balance of Payment (2016), Indonesia was facing a total deficit of US$ 8.29 billion in 2015 and almost 74% deficit came from transportation service. Overall, this potential freight for CPO export has a potential to reduce the total deficit around 2.77% (potential freight = US$ 229.86 million) .

3.4 Summary

1. The vast majority of Indonesian export products are shipped under Free on Board (FOB) term. Under this term, foreign vessels transport most of Indonesian CPO.
2. In terms of value and volume, Indonesia is the world's largest exporter of palm oil. It points out that Indonesia's market position is strong as palm oil producer compared to other countries. Meanwhile, Indonesian CPO is transported to the five biggest importing countries by volume; they are India, the Netherlands, Malaysia, Singapore and Spain.

It should be noted that Malaysia and the Netherlands are discovered as the biggest importer as well as the largest producer of palm oil. These two countries play the same role as re-exporter of Indonesian CPO, even though Malaysia has basically a large palm oil plantation.

3. The type of ships commonly used to transport CPO is chemical tanker and the average size of ship is General Purpose Tanker. Meantime, the shipping service of palm oil is tramp shipping and the shipment is categorized as bulk shipping.

   Currently, foreign-flag vessels give a high contribution for Indonesian CPO export. This caused by the availability of national ships and delivery time of the demand may not always line up to each other because it is tramp shipping.

   Palm oil market shows that Malaysian or Singaporean companies organize almost trading and transport of Indonesian CPO. This condition also evidence that approximately 22% of Indonesian CPO is exported with Singaporean and Malaysian vessels.

4. Potential freight of Indonesian shipping to export CPO ranging from US$ 217.42 to US$229.86 million in 2015. From the trend line of CPO export, this value may continue to grow in the near future because of two reasons. First, the volume of export is increasing based on the trend line in the past years. Second, the historical data indicates that there is possibility of freight to reach the peak because the current freight rates is at rock bottom.

5. The availability of national ships should be considered before shifting the ToD from FOB to CIF. The decision to use a CIF terms is highly depending on several variables ranging from price, quality and reliability. To promote national shipping, Indonesia should have at least 536,000 DWT (32 units of various size of chemical tanker) to serve the five biggest importing countries of Indonesian CPO.

6. Only if national shipping company is ready to serve Indonesian CPO export to worldwide, then this potential freight for CPO has a potential to reduce the total deficit in 2015 around 2.77% (potential freight = US$ 229.86 million).

4 Coal

This chapter deals with the evaluation of shifting ToD from FOB term to CIF term specific for Coal. As we did in Chapter 3, this chapter is started from an overview of coal industry in Indonesia, followed by current market condition of Coal. Analysis of the current market condition will be conducted not only from supply side, but also from demand side. Analyzing from supply side will include production capacity and the importance of coal in term of export on the overall Indonesian export basket. Meanwhile, from the demand side, the global market share of Indonesian coal will be elaborated as well as the main importing countries.

Shipping market condition of coal transport will be discussed not only in Indonesia but also worldwide in the second section. Types and sizes of ship commonly used in transporting coal will be elaborated and will be used as a benchmark in the further calculation process.

In the third section, we present the evaluation of shifting ToD of coal from FOB term to CIF term, which is the main substance of this chapter. The evaluation is conducted by comparing the existing ToD of coal in FOB term with the calculated CIF term.

This chapter ends with concluding remarks containing a summary of the previous sections.

4.1 Commodity Market

4.1.1 Coal Industry in Indonesia

The Indonesian coal industry production and export will fall further this year, as market conditions remain challenging. Indonesia has emerged as the world's largest exporter of thermal coal, supplying around one third of the seaborne market.

Ministry of Energy and Mineral Resources of Republic of Indonesia has developed a series of guides to help existing and prospective holders understand the regulation around the issue of permits, and their responsibilities as a permit holder. The guide provides information about these permits can be found at The 1945 Constitution Article 33.3, Law No. 4 of 2009 and consider the Government Regulation No. 22, 23, 78, 55 of 2010.

Figure 4.1: Coal Supply Chain[1]

Mining activities can take place through open cut or underground mining methods. The mining process involves the removal of overburden and extraction of coal. After the coal extracted from the mines, most of coal is loaded into truck-and-trailer road trains at stockpile in the mine site and hauled to private river terminal. The trucks and trailers together have an average capacity of 130 tons. Hauling sometimes is done along an almost-straight and sealed haul road owned by the companies.

All coal stockpiling, crushing and barge-loading activities handled in river terminal. The trucks dump it into giant hoppers and enter a screening and crushing system where it is broken into pieces. It is then conveyed either directly to waiting barges or into one of two stockpiles for loading later.

Coal that is barged downriver from the river terminal is destined for delivery in three ways: about 75% is barged straight to companies open-sea anchorage and for transfer to international customers' ships waiting there, about 20% is barged directly to Indonesian customers via the Java Sea, and about 5% is barged to companies coal storages and docksides loading facility.

Coal arriving by barge at open-sea anchorage must be loaded to waiting customers' vessels immediately. Some customers' ships are geared and equipped with their own cranes to load the coal from barges, but most are gear-less and are loaded using floating cranes provided at the anchorage point. Coal that is not transshipped at open-sea anchorage or barged directly to Indonesian customers is taken to a companies' storage and loading facility.

4.1.2 Production of Coal

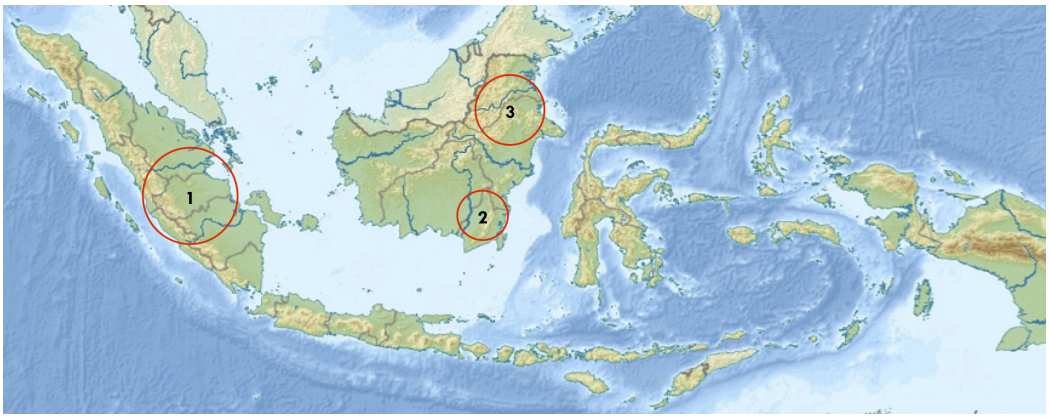
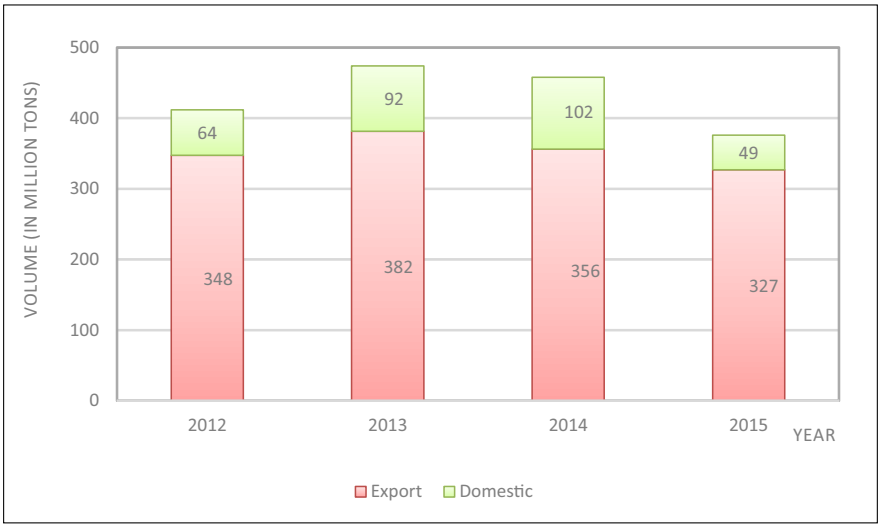


Figure 4.2: Indonesian Coal Resources[7]

As one of the world's largest producers and exporters of coal, there are three largest regions of Indonesian coal resources: South Sumatra, South Kalimantan and East Kalimantan. The Indonesian coal industry is rather fragmented with only a few big producers and many small players that own coal-mines and coal mine concessions. The country is leading exporter in thermal coal, which consists of a medium-quality type (between 5100 and 6100 Cal/gram) and low-quality type (below 5100 cal/gram). According to information presented by the Ministry of Energy, Indonesian coal reserves are estimated to last around 83 years if the current rate of production is to be continued.

Since the early 1990s, when the coal mining was reopened for foreign investment, Indonesia witnessed a robust increase in production; coal exports and domestic sales. Figure 4.3 illustrates the coal production in 2012-2015. It is measured in volume by million tons. Overall, it can be seen that the coal exports tend to fluctuate, but the domestic consumptions increase slowly throughout this time.



Source: Indonesian Coal Mining Association (APBI) and Ministry of Energy and Mineral Resources

Figure 4.3: Indonesian Coal Production, Export and Domestic Consumption

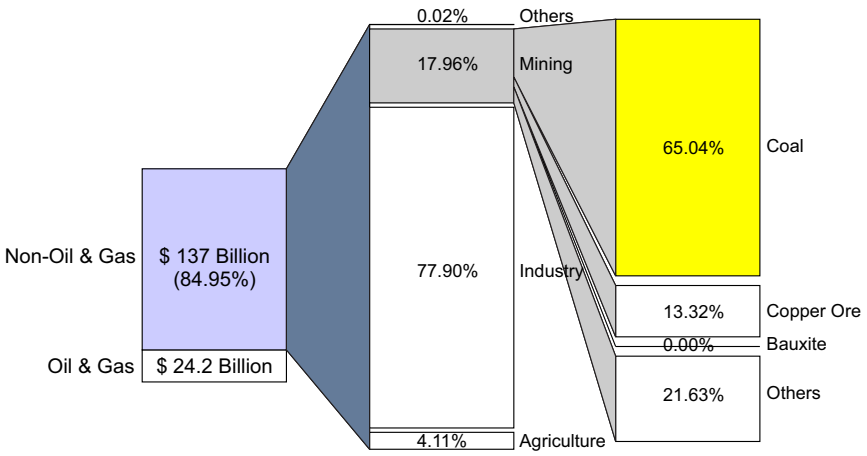
At the beginning of the period, the volume of export far exceeded that of domestic, standing at 348 million tons compared to 64 million tons for domestic. In 2013, both export and domestic increased respectively. Over the next two years, export decreased quite considerably, dropping around 300 million tons by 2015, while domestic's volume had managed only a small increased.

Compared to other coal producers like America, Australia, China, and India, Indonesia is anomaly. These countries generally have a level of production and reserves larger than Indonesia, but their exports much lower. This is caused by the difference in viewpoints in the utilization of resources.

4.1.3 Indonesian Coal Export

Coal export has been an engine of economic growth in Indonesia, however, after reaching a peak in 2012, it has been in a steady decline due to lower commodity prices and dwindling global demand.

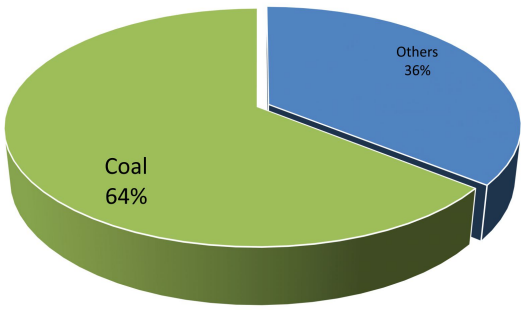
As already mentioned in the previous section that major Indonesian export was dominated by non- oil and gas, which accounted by 85% (US$24.2 billion) of the total export value in 2015. Coal products belong to the sub-sector mining, which is part of non-oil & gas sector. The contribution of coal export on total Indonesia export basket was 10% in 2015 as shown in Figure 4.4.



Source: Modified from Directorate General of Industry (2015)

Figure 4.4: Indonesian Export Commodities by Sectors

On the other hand, total Indonesian export in term of volume in 2015 was 509 million tons, while total coal export in term of volume on the same period was 327 million tons. This means that the contribution of coal export on total Indonesian export in term of volume in 2015 was 64%.



Source: Modified from Central Bureau of Statistics of Indonesia (2015)

Figure 4.5: Proportion of Coal on the Total Export of Indonesia by Volume

4.1.4 Global Market Share

According to the International Trade Center (2015), top five producers of coal are Australia, Indonesia, Russia, USA and Columbia. Global market share of these top five producers in term of value (FOB prices) and volume can be seen in Table 4.1 and 4.2.

Table 4.1: Total Value Top Five Exporting Countries

Country	2013		2014		2015	
	million $	%	million $	%	million $	%
Australia	38.24	34.2%	35.14	36.0%	29.63	38.8%
Indonesia	22.77	20.3%	18.70	19.2%	14.66	19.2%
Russia	11.82	10.6%	11.64	11.9%	9.48	12.4%
USA	11.25	10.0%	8.46	8.7%	5.67	7.4%
Colombia	6.25	5.6%	6.43	6.6%	4.26	5.6%
South Africa	5.83	5.2%	5.19	5.3%	4.25	5.6%
Others	15.78	14.1%	11.92	12.2%	8.40	11.0%
TOTAL	111.95	100.0%	97.47	100.0%	76.35	100.0%

Source: Modified from International Trade Center (2015)

Table 4.2: Total Volume of Top Five Exporting Countries

Country	2013		2014		2015	
	million ton	%	million ton	%	million ton	%
Australia	355.42	26.6%	384.24	29.3%	386.11	32.0%
Indonesia	381.53	28.6%	356.30	27.2%	327.18	27.1%
Russia	138.98	10.4%	153.16	11.7%	152.66	12.6%
USA	125.56	9.4%	92.86	7.1%	72.76	6.0%
Colombia	74.76	5.6%	87.12	6.7%	72.79	6.0%
South Africa	76.29	5.7%	78.66	6.0%	81.84	6.8%
Others	182.01	13.6%	156.93	12.0%	114.52	9.5%
TOTAL	1,334.55	100.0%	1,309.27	100.0%	1,207.87	100.0%

Source: Modified from International Trade Center (2015)

Australia and Indonesia remained the world's largest coal exporters in 2015, with 32% and 27% of exports on a tonnage basis. This combined 59% of trade was a record, despite Indonesia's exports was declining by 9.8%, record exports from Russia, and near record exports from both USA and Colombia.

4.1.5 Ports of Export

Port of export denotes as a place from where a shipment destined for a foreign importer leaves the exporting or producing country. The table below illustrates the percentage and total shipment of exporting port in 2011. Most of exporting

port owned by private companies called private ports or special purpose ports. As an example of special purpose ports is located in South Kalimantan province such as Port of Kotabaru and North Pulau Laut Coal Terminal.

Most of Indonesia's exporting ports are transshipment terminal, which is located inside of the river or far away from the coast. Coal transported from the transshipment terminal to open-sea is anchoraged by barge and transferred to international customers' vessel. The other ports of export (non transshipment) can directly accommodate to the customers' vessel because the depth of the port can meet the draft of the vessel.

Table 4.3: Ports of Export for Indonesian Coal by Shipment

Name of Port	Province	Shipment	%
Muara Berau	East Kalimantan	863	16%
Taboneo	South Kalimantan	516	10%
Samarinda	East Kalimantan	405	8%
Kotabaru	South Kalimantan	376	7%
Tg. Bara	East Kalimantan	351	7%
Others		2,773	52%
TOTAL		5,284	100%

Source: Modified from Directorate General of Sea Transportation (2011)

4.1.6 Main Importing Countries

Table 4.4 shows the main export destination countries for Indonesian coal such as China, India, Japan and South Korea. Coal has a clear importance for Indonesia's state revenue as the commodity accounts for around 85% of mining revenue.

Table 4.4: Top Five Importing Countries of Indonesian Coal by Volume

Importing Country	Volume (thousand tons)	%
China	99,280	24%
India	136,352	33%
South Korea	35,632	9%
Japan	35,585	9%
Taiwan	27,272	7%
Others	74,118	18%
TOTAL	408,238	100%

Source: Modified from Central Bureau of Statistics of Indonesia (2015)

Indonesia has strategic geographical position towards the giant emerging markets of China and India. Demand for low quality coal from these two countries

has skyrocketed as many new coal-fired power plants have been built to supply electricity to their immense populations.

Overall, in 2014, the most significant importing countries of coal were India and China, which together accounted for over half the proportion of coal export. While South Korea, Japan, Taiwan and other countries were only minimal proportion over this year.

Based on the Table 4.4, coal transported to India comprised of 33% (136 million tons) of the total volume. The second largest importing country came from China, which was 24% (99,280 million tons) of the total, followed similar percentage from South Korea and Japan accounted for 9% (around 35,500 million tons) respectively. Only small percentage transported to Taiwan at 7% (27,272 million tons) exports volume. Then, 18% or 74,118 million tons of the total coal volume exported to Thailand, Philippines, Malaysia, USA, the Netherlands and other countries.

4.1.7 Existing Terms of Delivery

Currently, most Indonesian exporters still utilize the free on board (FOB) system for transporting goods overseas, through which they pass the risk of loss to buyers who pay the cost of insurance and freight, although there are few transactions using the cost and freight (CFR) system. Figure 4.6 presents the implementation of Incoterms in Indonesia for Coal product based on top five coal companies in Indonesia.

Figure 4.6: The Implementation of Incoterms for Indonesian Coal Export

This scheme illustrates the terms of delivery (ToD) that has been used in Indonesia. Overall, it can be seen that coal export products are directly deliver from seller (Indonesia) to end user (importing country/ buyer) either with FOB term or CFR term. Almost ToD that has been used for coal export is dominated by FOB, although the used of CFR is possible for only few companies under certain conditions. First, the buyer might use CFR as ToD for coal export if the freight offered is relatively lower than freight, which is produced by the company itself. Second, the freight that is offered in CFR term should not higher than 8% of the coal price.

4.1.8 Coal Benchmark Price

The Benchmark Price for mining products must be determined pursuant to a market mechanism and/or in accordance with prevailing prices in international

markets. In selling mining products, Production Operation IUP/IUPKs holders are obliged to comply with the Benchmark Price, which is applicable to sales made to either domestic parties or foreign parties (pursuant to export trading activities) and any sales made to affiliate of the Production Operation IUP/IUPKs holders.

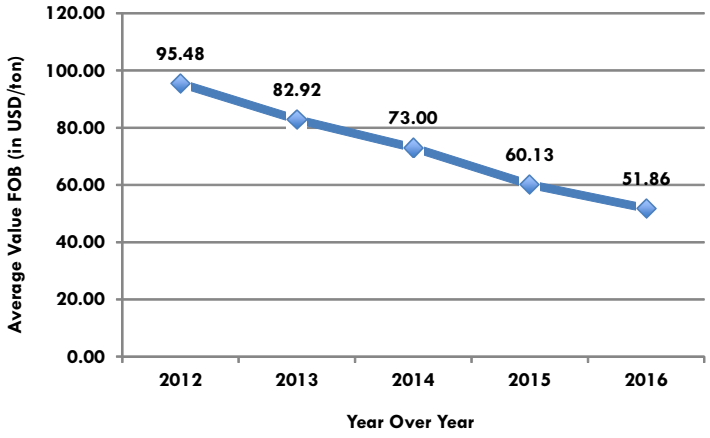
Government Regulation 23, as further elaborated by Ministry Regulation No. 17 provides the framework, which authorizes the Minister to set the mineral and coal sales reference prices. Broadly, the Minister, will be responsible for setting the Benchmark prices for coal and metallic minerals.

The Benchmark price is set at the Free on Board (FOB) vessel point of sale. Accordingly, certain costs are accepted to adjust the Benchmark price if the delivery takes place at a point other than the FOB vessel (i.e. FOB barge or CIF). The allowable adjustments would include the costs of barging, surveyors, insurance and transshipment.[16]

The Benchmark price serves as the floor price for the Government Royalty calculation. If the actual sales price is higher than the Benchmark price, the Government Royalty will be based on the actual sales price. If actual sales are below the Benchmark price, the Government Royalty calculation should be performed based on the Benchmark price.

The Benchmark price is applicable for spot sales and long-term sales. The Government Royalty will determine the Coal Benchmark Price on a monthly basis and accordance with market prices. The coal benchmark price shall distinguish between the following:

1. The benchmark price for steam (thermal) coal, being coal used as fuel for power plants and steam machines in industries ("Steam Coal"); and
2. The coal benchmark price for coking (metallurgical) coal, being coal used in iron smelting industries or metallurgy ("Coking Coal").



Source: Modified from Ministry of Energy and Mineral Resources (June 2016)

Figure 4.7: Average Coal Price Per Year (2012-2016)

Indonesia's benchmark thermal coal reference price (in Indonesia: *Harga Batubara Acuan,* or HBA), fell by 14% to a new record low of 51.86 US$/ton (FOB) in 2016 from 60.13 US$ in 2015. However, the month-on-month decline is smaller than decline recorded in the preceding months. Demand from Indonesia's main export markets is not expected to improve significantly in the short-term. On the other hand, domestic coal demand may grow in the year ahead due to accelerating economic growth, growing industrial output and new coal-fired power plants that are coming online [8].

4.2 Shipping Market

The transport system in the shipping industry has developed to carry many diverse ranges of commodities and each handling a different group of trades. In other words, the type of ship depends on the type of cargo carried. For example, energy and mining product trades are dominated by bulk shipping. This group of commodities, which accounts for close to half of seaborne trade, includes coal products. Since coal products is categorized as a dry bulk because it has to be shipped from one shipper to one consignee in a big amount, then the evaluation of shipping market in this section will focus on the dry bulk shipping industry.

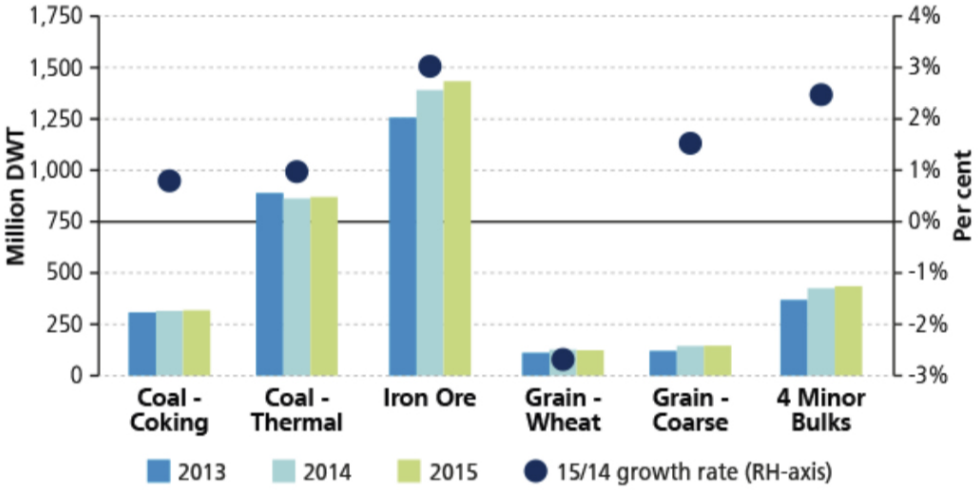
4.2.1 Ship Type

As already stated in Section 2.2, the type of ships commonly used to transport coal belongs to the group of dry bulk carrier due to the large volume and long haul shipping, while barge also utilized to transport the cargoes due to the limited access in canal and river area, short draught and short distance shipping.

On the basis of products, dry bulk cargo is generally categorized as either major bulk or minor bulk. Major bulk cargo constitutes the vast majority of dry bulk cargo by weight such as iron ore, coal and grain. Minor bulk cargo includes products such as agricultural products, mineral cargoes, cement, forest products and steel products [12]. Demand of dry bulk products in the last three years can be seen in Figure 4.8.

In terms of number of ships used, global dry bulk fleet as a whole has only grown by 0.5% since early February 2015. This has happened as the demolished volumes have matched the number for new buildings being delivered [3]. The Capesize fleet is actually smaller today than one and half year ago. The development in Panamax and Handysize segment is flat, whereas the Handymax or Supramax segment has slightly grown.

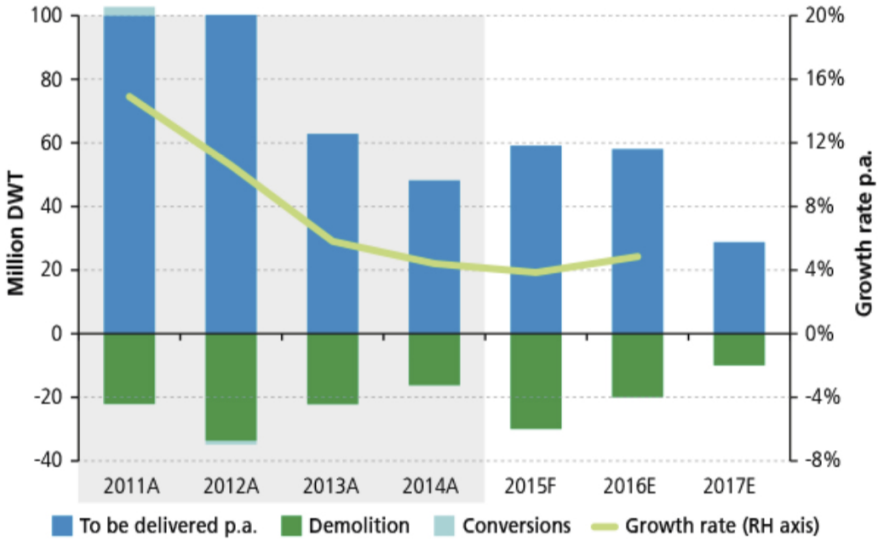
However, the growth in tonnage still exceeds the growth in demand, which results in overcapacity, though this factor is obscured by slow steaming, which keeps ship capacity on sea for longer periods of time. Overall, the tonnage



Sources: BIMCO, Simpson Spence Young Consultant

Figure 4.8: Demand of Dry Bulk Carrier in Volumes

will increase in 2016 due to a higher delivery pace and a decline in carrier's scrapping rate. Following in 2016, the tonnage influx is expected to remain flat in the period 2017 to 2019. The global dry bulk carrier trend can be seen in Figure 4.9.



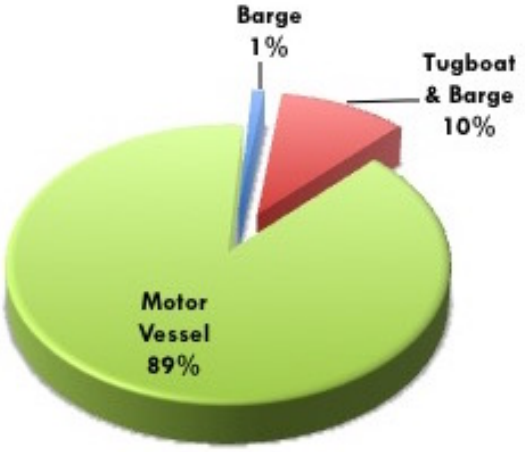
Source: BIMCO estimates on Clarksons raw data[3]

Figure 4.9: Trend of Global Dry Bulk Carrier

4.2.2 Indonesian Fleet Availability

One of the objectives of this study is to evaluate the availability of Indonesian fleet to potentially offer the service to replace foreign-flag ships. Therefore, we

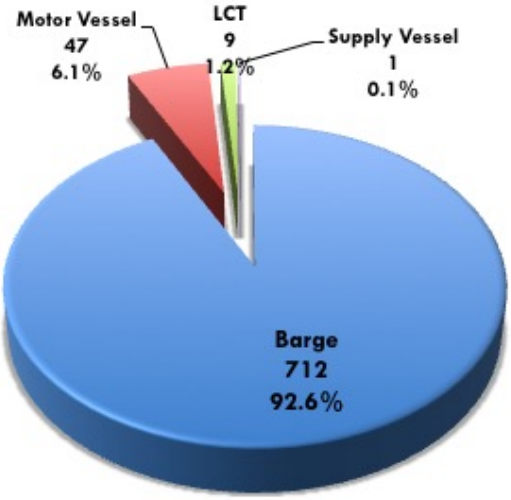
present the availability of Indonesian fleet to carry Indonesian coal.



Source: Modified from Directorate of Seaborne Traffic (2011)

Figure 4.10: Coal Transportation for Export

According to the Ministry of Transportation, the type of vessel that is used for coal exports divided in three categories namely motor vessel or dry bulk carrier, tugboat with barge and only barge. It is clear that the largest proportion to export the coal went on motor vessel or dry bulk carrier for 89% (4,687 shipments) of the total shipment in 2011. The second position is tugboat with barge at 10% (545 shipments) and followed by barge with only 1% (53 shipments) of the total shipment.



Source: Modified from Directorate of Seaborne Traffic (2011)

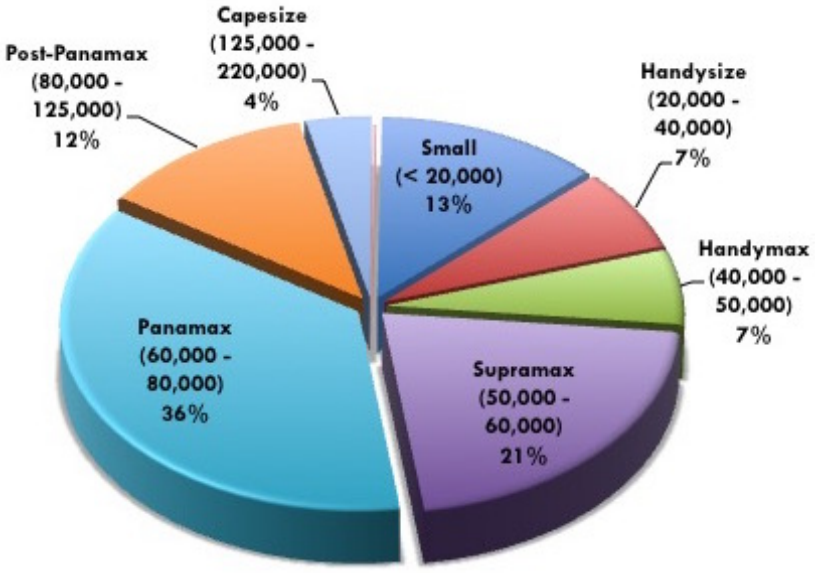
Figure 4.11: Type of Indonesian-flag Vessel for Coal

According to the Ministry of Transportation, the type of vessel, which is suitable for coal exports is motor vessel (dry bulk carrier) as can be seen in Figure 4.11.

This motor vessel accounted only 47 units (6.1%), while other type of vessels is not very suitable for long haul shipping. Furthermore, more than 90% of Indonesian-flag vessel is barge and mostly used for domestic or short distance transport, while coal exports served by foreign vessels. This condition indicates that for export purposes, Indonesia is still lack of dry bulk carrier especially for transporting Coal.

4.2.3 Shipments of Indonesian Coal

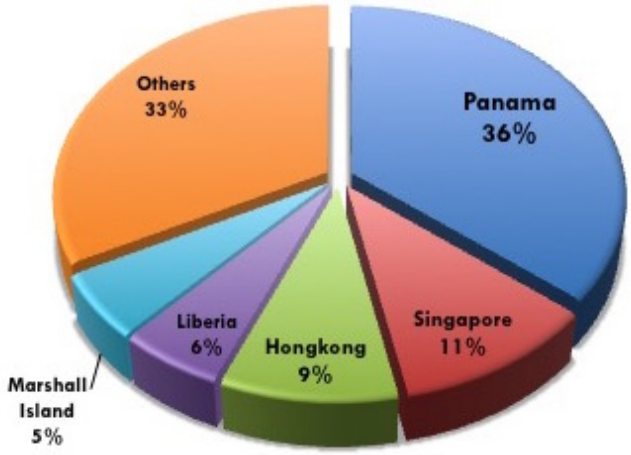
According to the Ministry of Transportation, in 2011 there were 5,258 shipments of Coal export, where 1,915 shipments or 34% transported with Panamax Size and followed by Supramax dry bulk carrier with 1118 shipments or 21%. Meanwhile, the proportions of shipment were quite similar for Post-Panamax and Small vessels at 12% and 13% respectively. Furthermore, Handysize and Handymax had the same proportion at 7% of the total shipment. The last one, Capesize vessels is focused on long haul coal trade, which accounted for 4% of total shipment. The proportion of shipment of Indonesian Coal by size of ships can be seen in Figure 4.12.



Source: Modified from Directorate of Seaborne Traffic (2011)

Figure 4.12: Shipment of Indonesian Coal by Size of Ships

In terms of flag states, there are five biggest flag states of dry bulk carrier used for Indonesian Coal export. The big five of the flag states of dry bulk are Panama, Singapore, Hong Kong, Liberia and Marshall Island. The proportion of flag states of dry bulk carrier for Indonesian Coal export can be seen in Figure 4.13.



Source: Modified from Directorate of Seaborne Traffic (2011)

Figure 4.13: The Big Five Flag States for Indonesian Coal Export

From the big five flag states, there are three countries that implement Flag of Convenience (FOC), which is closely related to open registry term. These three countries are Panama, Liberia and Marshall Island with the total proportion of 47% of total ships used.

4.3 Evaluation of Shifting ToD

4.3.1 Basic Calculation

As already stated in Section 4.1, Coal is always shipped in bulk, therefore, evaluation of shifting ToD is conducted by applying common characteristics of bulk shipping.

Based on the standard of trade terms in Incoterms (see Section 2.1) the division of responsibility between sellers and buyers in FOB term and CIF term can be seen in Figure 3.17. Similar to previous calculation, this study will focus on area of **sea freight and insurance cost.** The insurance cost is market driven and will not calculate in detail. Meanwhile the unloading cost is not calculated regarding to the freight contract. The only cost that will be calculated and to be compared is sea freight.

We used one route taken from one of the biggest Coal exporter in Indonesia in this basic calculation. The route selected as a case study is from Port of Samarinda, East Kalimantan to Port of Guangzhou, China with the total distance of 1,900 nautical miles as seen in Figure 4.14 below.

Figure 4.14: Selected Routes of Coal for Case Study

Based on the information gathered from the interviewe with one of the biggest exporters in Indonesia[1], Coal from Port of Samarinda to Port of Guangzhou mostly shipped by dry bulk carrier with the size of about 73,000 DWT and payload capacity of about 65,000 tons. The freight in the past year has been fluctuated ranging from US$4.1 - 8.5 per ton where the current freight is US$ 6.00 per ton. It should be noted that this freight is only consist of sea freight for the transaction of voyage charter for one voyage.

1. **Port of Origin**

   Port of Samarinda is the busiest public port in East Kalimantan, which has two-anchorage area, first in Muara Pegah (Muara Jawa) and Muara Berau. The main facilities and equipment of Port of Samarinda can be seen in Table 4.5 below:

Table 4.5: Port of Samarinda Main Facilities

Port Facilities	Specifications	Unit
Harbor type	River Port	
Transshipment area	Muara Pantai	
Dry bulk depth	7.9	mLWS
Anchorage depth	23.2	mLWS
Type of loading/unloading	Floating Crane	
- Productivity	15,000	ton/day

2. **Port of Destination**

   Port of destination in this case study is Port of Guangzhou, China. This port lies at the estuary of the Pearl River in South China coast, consisting

[1] As per company requested, the company name is not mentioned in this report

of seaport and inland river port. The terminal dedicated for Coal is located in Xinsha Port Area, which is the largest port in South China for loading and unloading one of the region's major energy sources. Main facilities and equipments of Xinsha Port Terminal is as follows:

Table 4.6: Port of Guangzhou Main Facilities

Port Facilities	Specifications	Unit
Harbor type	River Port	
Transshipment area	Pearl River Delta	
Dry bulk depth	15.6	mLWS
Anchorage depth	22.5	mLWS
Berths length	809	m
Type of loading/unloading	Clamshell Crane	
- Productivity	20,000	ton/day

3. **Ship Specification**

As already mentioned, the ship used in this case study is based on the information we had during the interview with the company. This ship is a dry bulk carrier with the type of freight transaction is freight contract (voyage charter) for one voyage. The specifications of the ship is shown in Table 4.7 as below:

Table 4.7: Specifications of Ship Used in Coal Case Study

General Information		
Type	MV. NAIAS	
Year Built	June 2006	
Builder	Jiangnan Shipyard Co. Ltd	
Flag	Marshall Islands	
Classification	Bureau Veritas	
DWT	73,664	ton
LWT	27,624	ton
Payload	65,000	ton
Gross Tonnage (GT)	40,166	ton
Net Tonnage (NT)	26,711	ton
Main Dimension		
Length Over All (LOA)	225.0	m
Length Between Perpendiculars (LBP)	217.8	m
Breadth Moulded (B)	32.3	m
Moulded Depth (H)	19.2	m
Draft Summer (T)	14.0	m

Service Speed (Vs)		
Ballast Speed	14.5	Nm/hour
Laden Speed	12.3	Nm/hour
Power Engine		
Main Engine	9651	kW
	1	unit
Aux. Engine	849	kW
	3	unit
Specific Fuel Oil Consumption (SFOC)		
Main Engine (DO)	192	g/kWh
Auxiliary Engine (DO)	201	g/kWh
Specific Lube Oil Consumption (SLOC)		
Main Eng & Aux. Eng	0.9	g/kWh
Commision Days	330	days/year
Crews	22	person

4. **Freight Information**

The freight information based on the interview which will be used as a benchmark in further calculation is as follows:

Table 4.8: Freight Information for Base Calculation

Item	Remarks
Freight	$6.00/ton (only sea freight)
Freight Transaction	Voyage charter for one voyage ⇒ mean that the freight only for one way
Loading/ Unloading cost	These cost is not including in the freight rates
Insurance	unknown

Similar to CPO case study, after understanding the current condition of the ToD, freight, ship specifications and freight transactions as mentioned in the previous items, then we have to verify the information by calculating the costs incurred by the shipowner. The aim of this verification is to obtain the estimated costs of the sample ship, which will be used as a basis for further calculation when freight estimation of different route, different ship, and different volume of Coal is required.

Verification of Freight

In this verification, we need to calculate the estimated shipping costs such as the freight is equal to $6.00/ton for one voyage as seen in Table 4.8. In order to do this, we have to categorize the shipping costs into two groups, fixed costs and variable costs. Fixed costs are consisting of capital cost, operating cost and maintenance cost, while variable costs are consisting of voyage cost and cargo handling cost. The methodology we used to calculate these costs is as follows:

1. **Capital Cost**

   Similar with the previous case study, the estimation of ship price is collected by regression method. For 10-year-old ship and by assuming of 25 years of economic life, the ship price is estimated of US$ 21,665,765.

2. **Operating Cost**

   Operating costs are fixed costs, which constitute the expenses, involved in the day-today running of the ship. In order to calculate these costs, we use assumptions as follows:

   a) Number of crews is 24 persons with average salary of US$1,825 / person/ month.

   b) Stores and supplies are a function of the number of crew and their provision per day, which is assumed to be US$7.64/ person/ day.

   c) Lubricating cost is depend on the specific lubrication oil consumption which is contained in the ship specifications (see Table 4.7).

   d) Insurance cost is assumed to be 1% of the ship price.

e) Administration cost is assumed to be 5% of the total operating costs.

3. **Maintenance Cost**

   Maintenance cost is divided into two categories. First is an annual maintenance, which is assumed to be 1% of the ship price. Second is a special survey every 2 years, which is assumed to be 4% of the ship price.

4. **Voyage Cost**

   Voyage costs are variable costs associated with a specific voyage consisting of fuel cost (main engine and auxiliary engine) and port cost. Fuel cost depends on the fuel consumption of the engine (see Table 4.7) and fuel price. Meanwhile, port costs are considering for both port of origin and port of destination are as follows:

Table 4.9: Port and Cargo Handling Charges in Port of Samarinda

Description	Unit	Value
Anchoring	US$/GT/Call	0.12
Mooring/Unmooring	US$/GT	0.11
Pilotage	-	-
- Fixed tariff	US$/movement	109
- Variable tariff	US$/movement	0.04
Tugboat	-	-
- Fixed tariff	-	-
(26,001 - 40,000 GT)	US$/movement	1,855
(40,001 - 75,000 GT)	US$/movement	1,952
> 75,000 GT	US$/movement	2,342
- Variable tariff	US$/movement	0.01
Cargo Handling Cost	US$/Ton	2.25

Table 4.10: Port and Cargo Handling Charges in Port of Guangzhou

Description	Unit	Value
Anchoring	US$/GT/day	0.23
Mooring/Unmooring	-	-
Vessel of <2000 GT at buoys	US$/service	23.85
Vessel of >2000 GT at buoys	US$/service	47.70
Opening/Closing Hatches	-	-
Vessel of 2000 GT and	US$/hatch	39.60
below	US$/hatch	79.50
Vessel of 2000 GT and above		
Pilotage	US$/GT	0.08
Shifting	US$/GT	0.03
Pilot Time Lost for Waiting	US$/GT	3.00
Cargo Handling Cost	US$/Ton	2.03

5. **Cargo Handling Cost**

   Cargo handling cost is not calculated in this validation process since this cost is remaining the same regardless the ToD used.

Basic calculation process has the same method as previous case study to define the voyage charter hire by calculating all fixed costs for the rest of economic life of the ship and then to calculate the annuity of these costs in order to estimate the voyage charter hire. As a result of this calculation, the estimated voyage charter hire is US$12,863/ day.

The next step is calculation of the voyage cost for one voyage (one way) since the information that we have to verify is for one voyage only. Calculation of this cost is based on sea time and port time assumption.

By assuming that operational time of the ship in port (not including loading/ unloading time) is 6 hours for both origin and destination ports, specifications of the ship (see Table 4.7), main facilities of ports (see Table 4.5 and 4.6), and port charges (see Table 4.9 and 4.10), then the result for one voyage is as follows:

Table 4.11: Calculated Freight for One Voyage

Description	Unit	Value
Voyage Time	days	16.00
Cargo Carried	tons/voyage	67,034.00
Voyage Charter	US$/day	15,283.00
	US$/voyage	244,523.00
Fuel Cost	US$/voyage	117,423.00
Port Dues Origin	US$/voyage	16,840.00
Port Dues Destination	US$/voyage	41,940.00
Fresh Water	US$/voyage	416.00
Total Freight	US$/voyage	421,142.00
	US$/ton	6.28

Table 4.11 shows that the calculated freight is US$6.28/ ton. The error of calculated freight with the data freight of US$6.00/ton is only 4.5%. Since this error is relatively small, we are confident to use this calculation method in this study for the further calculation.

4.3.2 Further Calculation

Further calculation illustrated what-if scenario of the coal export when the shifting ToD from FOB to CIF is implemented. The calculation method used for this scenario is based on the basic calculation in the previous sub-section.

On basic calculation, the calculated freight is for one voyage only with the shipment volume of 67,034 ton of coal. This sub-section will estimate what

will occur if the export of coal is conducted in different way and shipped by Indonesian-flag ships. In order to do this calculation, we use the same company with the same route, type and size of ship, whereas the only difference is the scenario of shipment.

The total export of coal of this company was 20,328,000 ton in 2015. By using this volume export for one year, then we developed scenarios of shipment for the total volume for one year instead of for one voyage. There are two scenarios of shipment based on the type of freight transactions:

- Voyage Charter
  In this scenario, the contract of shipment is conducted for the total volume for one year by using voyage charter scheme. In other words, the cargo owner (in this case the seller of coal, since it is CIF term) buys sea transport services from the shipowner for one year, instead of one voyage. In this case, the cargo owner does not wish to become actively involved as an transport operator.
- Time Charter
  In this scenario, the cargo owners (the sellers of coal, since it is CIF term) hire ship(s) for a certain period and prefer to manage the transport by themselves.

Scenario 1: Voyage Charter

As previously mentioned, the contract to transport the coal between the cargo owner (coal seller, since it is CIF term) and the transporter (shipowner) is done in one-year period. In the voyage charter contract, the transport management is under shipowner responsibility.

Since the objective of the development of the scenario is to analyze the possibility of shifting the ToD from FOB to CIF, then in order to make a commensurable calculation, the volume of coal transported and specification of ship used are similar to the current condition (see Section Basic Calculation).

The freight in this scenario is calculated based on one-year voyage charter contract with specific demand of export for one year (20,328,000 tons/ year). Under this conditions, the required frequency of ship to transport the cargo is 304 times/year (by dividing the specific demand of export for one year with specific ship's capacity), while the frequency of one ship is 15 times/ year (by dividing commission days in one year with one round-trip days). Therefore, we need at least 21 ships to transport all cargo for one year.

Afterwards, the total freight is calculated by multiplying the total frequency with all component costs per trip. The result of freight in this scenario is US$ 158,888,019/ year or US$7.82/ ton.

Scenario 2: Time Charter

While scenario 2 is conducted to find out other alternatives of freight under time charter contract. The main difference between Scenario 1 and Scenario 2 is the charter period. A voyage charter is hiring a vessel based on the frequency delivery of goods and specifications of the ship that is used for one-year period. While a time charter is hiring a vessel by Coal seller (which is act as the shipowner) based on whole one-year period.

With the same calculation method as previous scenario, the required frequency of ship to transport the cargo is 304 times/year, while the frequency of one ship is 17 times/ year. Thus, we need 18 ships to be chartered for one-year period. Then the total freight for one year can be obtained, yet there is one difference on how to calculate the freight. On this scenario, the total freight is calculated based on fixed cost and variable costs.

Fixed cost is calculated by multiplying the commission days for one year (365 days), time charter hire per day and amount of the ship required (18 ships). Meantime, variable costs are calculated by multiplying the total frequency for one year with variable component costs per trip. Therefore, the result of total freight in this scenario is US$ 149,147,106/ year or US$ 7.34/ ton.

If we compare these two scenarios, the freight on time charter is cheaper than freight on voyage charter. This occurs because the ship utilization on time charter is 100% (optimal) because the regularity of cargoes shipped and the ship utilization are at the equilibrium point, whereas the ship utilization under voyage charter is at 97% to carry the export volume.

It can be concluded that the freight rates are determined by the ship utilization. Meanwhile, the optimal freight rates can be reached when the ship utilization is optimal or by condition that demand (export volume) must be equal to the supply (ship's capacity).

Potential Freight for Indonesian Shipping Services

Potential freight means estimated freight for Indonesian shipping services from export transaction regardless the terms of delivery that is used (either with FOB or CIF terms). This section provides estimated freight of coal export shipment from the five biggest importing countries, which is China, India, South Korea, Japan and Taiwan.

In order to define the freight for each importing countries, it is assumed that fixed costs consisting of capital cost, operating cost and maintenance costs and variable costs consists of voyage costs and cargo handling cost are similar to basic calculation assumption. Meanwhile, the distance depends on the length between origin and destination ports. The assumption of origin port is Port of Samarinda, Kalimantan, Indonesia; whereas the destination port is depend on every country. The destination port is assumed by the highest shipment of coal.

The type of shipping charter to transport coal is similar to previous study (see Sub-Section 3.3.2). The potential freight is calculated under time charter and voyage charter contracts. Therefore, the result of potential freight for two scenarios is as follows:

Table 4.12: Potential Freight for Coal in Voyage Charter and Time Charter

No.	Importing Country	Freight (US$/year)	
		Voyage Charter	Time charter
1	China	916,923,305	856,006,807
2	India	1,036,555,336	971,235,636
3	South Korea	344,926,231	315,387,363
4	Japan	330,992,234	311,446,440
5	Taiwan	221,243,164	210,110,589
Total		**2,850,640,270**	**2,664,186,835**

Table (4.12) shows estimated freight for both voyage charter and time charter. This means that Indonesian shipping service has a potential freight ranging from US$2,664,186,835 to US$2,850,640,270 in 2015. This potential freight presents about 98% of the total volume of coal export and represents around 17% of the total FOB value, which consists of coal price, freight and insurance.

This potential freight for coal proves that Indonesian shipping service has a big opportunity to serve this export shipment, which is currently served by foreign vessels. Nevertheless, to shift in the ToD from FOB to CIF should firstly look at the condition of national fleet from quantity, quality, compatibility and reliability. From the further analysis, national shipping must have at least 16,249,000 DWT (270 unit of various size of dry bulk) to serve the five biggest importing countries of Indonesian coal.

According to Indonesia Balance of Payment (2016), Indonesia was facing a total deficit of US$ 8.29 billion in 2015 and almost 74% deficit came from transportation service. Overall, this potential freight for coal export has a potential to reduce the total deficit around 34.38% (potential freight = US$ 2.85 billion). By this percentage, it indicates the highly potential for serving Indonesian coal export by optimizing the use of Indonesian-flag vessels (barge and tug boat), particularly to transport among Asia countries.

4.4 Summary

1. Most Indonesian coal exporters still utilize the free on board (FOB) system for transporting goods overseas, although there are few transactions using the cost and freight (CFR) system. The buyer might use CFR as ToD for coal export if the freight offered is relatively lower than freight produced by the buyer itself.

2. In terms of value and volume, Indonesia is the second world's largest exporter for thermal coal after Australia. Coal has a clear importance for Indonesia's state revenue as the commodity accounts for around 85% of mining revenue. The medium-quality type and the low-quality type of Indonesian coal mostly fulfill the large demand from China and India as many new coal-fired power plants have been built to supply electricity to their immense populations.
3. The type of ships to transport coal depends on the distance to be covered. Tug and barges used for short distances within domestic markets or ASEAN countries and also as transshipment facilities to customers' vessel, whereas dry bulk carrier used for long distances such as international shipment. The average size of dry bulk vessel is Panamax vessel because it is shipped in large quantities. Meanwhile, the shipping service is categorized as tramp shipping and the shipment is categorized as bulk shipping.

   In fact, more than 90% of Indonesian-flag vessel is barge and mostly used for domestic or short distance transport, while coal exports served by foreign vessels. This condition indicates that for export purposes, Indonesia is still lack of dry bulk carrier especially for transporting Coal.

   However, approximately 10% (45 million tons) of the coal export is served by tug boat and barge. Therefore, with abundance national tugboat and barge, Indonesia has a potentiality to serve short distance shipment and to shift the existing ToD to CIF terms.
4. Potential freight of Indonesian shipping to export Coal ranging between US$2.66 to US$2.85 billion in 2015. From the trend line of Coal export, this value may continue to grow in the near future because the volume of export is increasing in the past years. Nevertheless, the freight value might be decreasing due to the freight market condition, which indicates continuous decline in the past years.
5. The availability of national ship should be considered first in order to shift the ToD from FOB to CIF. The decision to use CIF terms is highly depend on several variables ranging from price, quality and reliability. Indonesia should have at least 16.25 million DWT (270 unit of various size of dry bulk) to serve the five biggest importing countries of Indonesian Coal.
6. Only if national shipping company is ready to serve Indonesian coal export to worldwide, then this potential freight for coal has a potential to reduce the total deficit in 2015 around 34.38% (potential freight = US$ 2.85 billion). It indicates the highly potential for serving Indonesian coal export by optimizing the use of Indonesian-flag vessels (barge and tug boat), particularly to transport among Asia countries.

5 Rubber

This chapter deals with the evaluation of shifting ToD from FOB term to CIF term for Rubber particularly. As we did in Chapter 4, this chapter is started from an overview of natural rubber industry in Indonesia, followed by current market condition of rubber. Analysis of the current market condition will be conducted not only from supply side, but also from demand side. Analyzing from supply side will include production capacity and the importance of rubber in term of export on the overall Indonesian export basket. Meanwhile, from the demand side, the global market share of Indonesian rubber will be elaborated as well as the main importing countries.

In the second section, we discuss the shipping market condition of rubber transport for both Indonesia and global market. The common types and sizes of ship used in transporting natural rubber will also be presented.

In the third section, we present the evaluation of shifting ToD of rubber from FOB term to CIF term. The evaluation is conducted by comparing the existing ToD of rubber in FOB term with the calculated CIF term.

This chapter ends with a concluding remarks containing a summary of the previous sections.

5.1 Commodity Market

5.1.1 Rubber Industry in Indonesia

Natural rubber is produced from plant species *Hevea brasiliensis*. Rubber in Indonesia acts as a strategic commodity, foreign exchange generator of exports, a source of livelihood for many farmers, supporting environmental sustainability and biodiversity resources. This plant is very effective at absorbing carbon dioxide (CO2) pollutant about 35 tons per hectare per year, and at the same time releasing the oxygen (O2) about 23 tons per hectare per year. In other words, this plant is environmental friendly by environmental conservation, absorbing carbon and producing oxygen.

According to the government regulation, the only type of rubber to be sold in world market is processed rubber or crumb rubber. Rubber factories or crumb rubber processors could be seen as important players of rubber in the world

market, as the Indonesian rubber production is mostly allocated to fulfill the world demand of natural rubber.

Natural rubber supply chain in Indonesia from farm workers to trade-brokers can be seen in Figure 5.1.

Figure 5.1: Natural Rubber Supply Chain

The production system of natural rubber in Indonesia involves mostly smallholder growers or farm workers. The latex produced by these smallholders sells to the agents or collectors who collect latex directly from growers or farm workers. Normally the agents can be found in every place of rubber production center. In the city-level, there is middleman (big collectors) who will buy the rubber materials from village collectors to be traded in city-level or provincial-level. Middleman commonly own small trucks for transporting rubber from villages to the city for further process in crumb rubber factories.

5.1.2 Production of Rubber

According to the Gapkindo (Indonesian Rubber Association), Asia has been the largest rubber producing continent due to its economic and population growth. Asia accounts for about 93% of the world natural rubber production with Thailand being the largest producer followed by Indonesia and Vietnam.

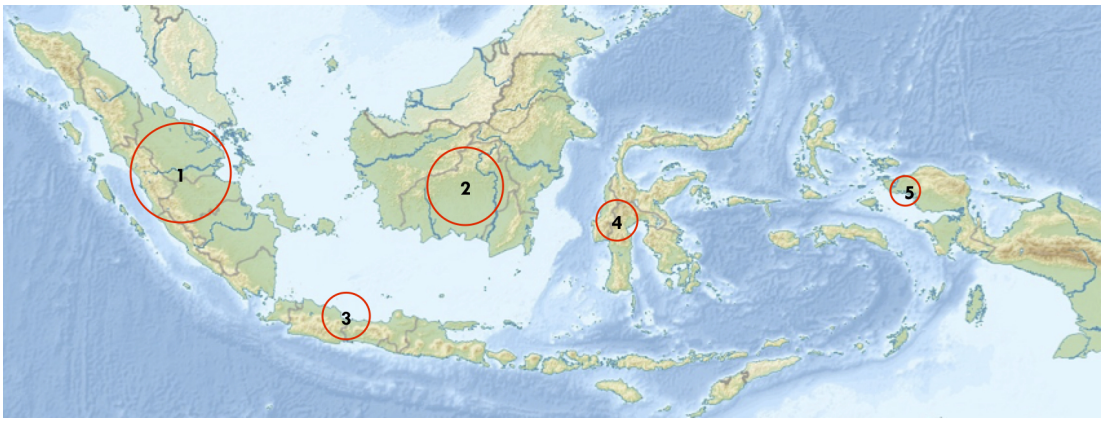
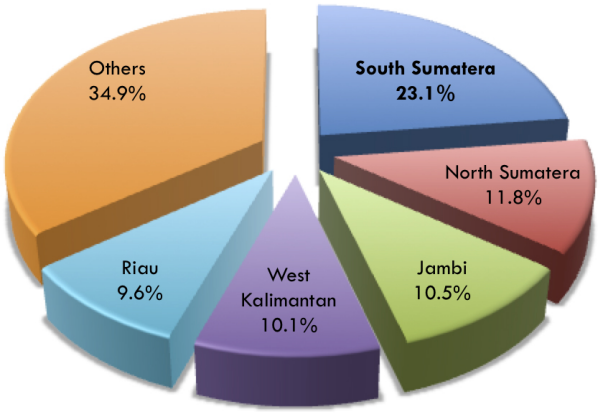


Figure 5.2: Indonesian Rubber Resources

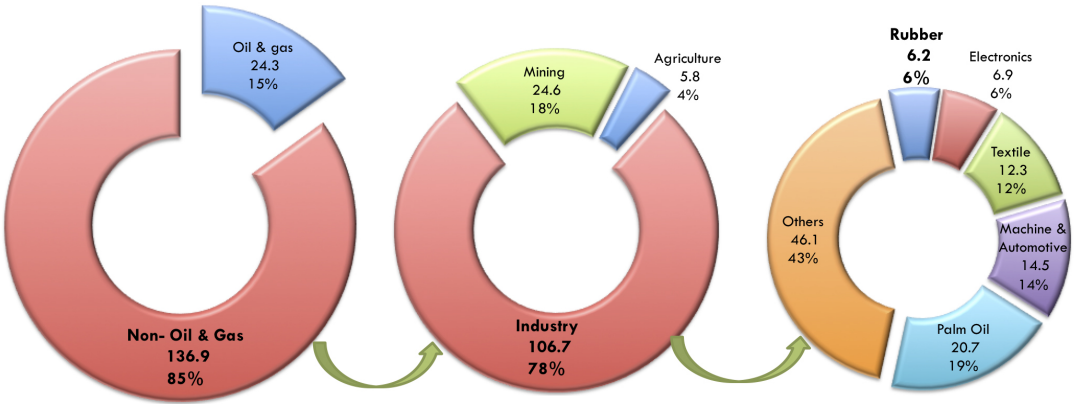


Source: Modified from Indonesian Rubber Association (2015)[14]

Figure 5.3: Indonesian Rubber Production Sites by Province

As the second largest natural rubber producer globally, the rubber production centers in Indonesia are commonly located in Sumatra such as the provinces of North Sumatra, Riau, Jambi, and South Sumatra; followed by Kalimantan such as the provinces of West Kalimantan, some in Central and South Kalimantan; but very few in Java, Sulawesi and Papua. Therefore, Sumatra and West Kalimantan are the key natural rubber producing area accounted by two third of the natural rubber harvested.

5.1.3 Indonesian Rubber Export



Sources: Modified Directorate General of Industry and Indonesian Rubber Association (2015)

Figure 5.4: Indonesian Export Commodities by Sectors (value in billion $)

Natural rubber is one of estate commodities playing important roles in Indonesian economy. It not only serves as a source of community income and wealth, but also drives economic growth in new economic centers surrounding the rubber estate. In addition, this commodity also significantly contributes a source of state foreign exchange since 84% of the Indonesian natural rubber are exported

as raw rubber, while only the rest 16% is consumed by domestic market. As an export commodities, natural rubber contributing about 6% or $6.2 billion from the total industrial sub-sector or the fifth largest export in value after palm oil, metal goods, garments, and processed food. Rubber is also the main commodity contributing the most foreign exchange from estate sub-sector.

In terms of volume, Indonesia rubber exported around 2.63 million tons to destination countries, whereas domestic rubber consumption is accounted by 0.54 million tons in 2015. According to the data presented from Central Bureau of Statistics of Indonesia, the total volume of natural rubber exported in 2015 was only one percent of the total export basket of Indonesia, which accounted for 509 million tons.

5.1.4 Global Market Share

According to the International Trade Center (2015), top five producers of coal worldwide are Thailand, Indonesia, Vietnam, Malaysia and Cote d'Ivore. Global market share of these top five producers in term of value (FOB prices) and volume can be seen in Table 5.1 and 5.2.

Table 5.1: Total Value Top Five Exporter Countries

Country	2013		2014		2015	
	million $	%	million $	%	million $	%
Thailand	8.23	31.7%	6.02	35.6%	4.98	37.8%
Indonesia	6.91	26.6%	4.74	28.1%	3.70	28.1%
Vietnam	2.38	9.1%	1.67	9.9%	1.07	8.1%
Malaysia	2.23	8.6%	1.40	8.3%	1.03	7.9%
Cote d'Ivore	0.76	2.9%	0.60	3.6%	0.50	3.8%
Others	5.49	21.1%	2.47	14.6%	1.89	14.3%
TOTAL	26.00	100.0%	16.91	100.0%	13.17	100.0%

Source: Modified from International Trade Center (2015)

Table 5.2: Total Volume of Top Five Exporter Countries

Country	2013		2014		2015	
	million ton	%	million ton	%	million ton	%
Thailand	3.44	36.3%	3.41	36.5%	3.65	39.1%
Indonesia	2.70	28.5%	2.62	28.1%	2.63	28.2%
Vietnam	0.99	10.5%	0.98	10.5%	0.73	7.8%
Malaysia	0.85	8.9%	0.72	7.7%	0.71	7.6%
Cote d'Ivore	0.26	2.7%	0.35	3.8%	0.41	4.4%
Others	1.23	13.0%	1.24	13.3%	1.20	12.9%
TOTAL	9.47	100.0%	9.33	100.0%	9.33	100.0%

Source: Modified from International Trade Center (2015)

Asia accounts for 93% of the world's natural rubber production with Thailand being the largest producer followed by Indonesia and Vietnam. Thailand exports about 39% in the amount of 3.65 million tons of rubber world's total demand in 2015. Meanwhile, Indonesia was on the second position by amounting to 2.63 million tons (28%) of the world's total demand for rubber commodity. Other exporter countries such as Vietnam, Malaysia and Cote d'ivory successfully maintained their shares in this rubber global market around 9%, 8% and 4%, respectively.

5.1.5 Ports of Export

In this case, the type of port for rubber is container terminal and public port. According to Indonesian Rubber Association (2014), Indonesia's largest rubber processing is in Sumatra and Kalimantan. Therefore, these islands have been becoming the largest location for rubber exports. The number of volume export of rubber was 2,570 thousand tons in 2014. There are five ports of export such as Port of Boom Baru, Port of Belawan, Port of Teluk Bayur, Port of Jambi and Port of Pontianak.

Table 5.3: Port of Export for Indonesia's Rubber by Volume

Name of Port	Province	Volume (thousand ton)	%
Boom Baru/Musi River	South Sumatra	1,041	41%
Belawan	North Sumatra	626	24%
Teluk Bayur	West Sumatra	238	9%
Jambi	Jambi	231	9%
Pontianak	West Kalimantan	192	7%
Others		243	9%
TOTAL		2,570	100%

Source: Modified from Indonesian Rubber Association (2014)

5.1.6 Main Importing Countries

Approximately 84% of Indonesia's rubber production is exported. Almost one fourth of export is shipped to United State of America (USA) followed by Japan and China. In detail, the USA imported approximately 625 thousand tons or 24% of total volume exported. This rubber consumption is mostly absorbed by manufacturing industries (in particular the automotive sector) in the USA. Meanwhile, Japan accounted for nearly 425 thousand tons or 16% of the total volume. The third position was China with 290 thousand tons or 11% of total volume. Meanwhile, India and South Korea accounted for 290 thousand tons (8%) and 183 thousand tons (7%), respectively. The other countries, which

dominated by Canada, Brazil, Germany Turkey and Singapore, were 903 thousand tons or 34% in total. The proportion of these importing countries can be seen as follows:

Table 5.4: Top Five Importing Countries of Indonesian Rubber by Volume

Importing Country	Volume (thousand tons)	%
USA	625	24%
Japan	425	16%
China	290	11%
India	205	8%
South Korea	183	7%
Others	903	34%
TOTAL	2,630	100%

Source: Modified from Indonesian Rubber Association (2015)

5.1.7 Existing Terms of Delivery

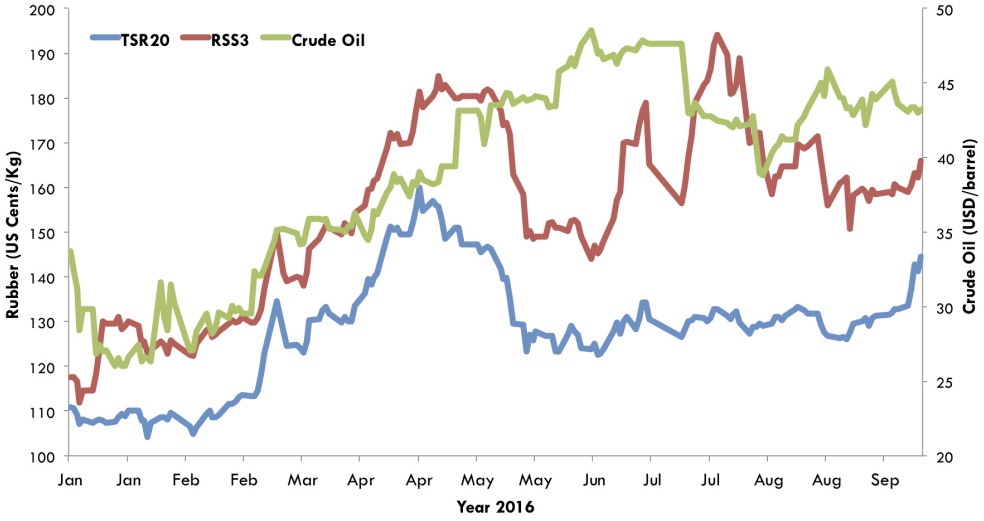
Most of Indonesian rubber exporters still use the Free On Board (FOB) system for transporting rubber overseas, yet there is one difference for the definition between FOB in Incoterms and FOB that is used among Indonesian exporters. They called this term as "Traditional FOB" to distinguish this term with FOB in Incoterms. Traditional FOB is similar to Free Alongside Ship (FAS) in Incoterms, where the seller delivers the goods alongside the vessel (e.g. on a quay for container) nominated by the buyer, not on board. This also emphasizes that buyer bears all the costs from that moment onwards, including terminal handling charges.

Manufacturer, seller and buyer of rubber in ASEAN countries make an agreement to use FOB in Incoterms as their commercial terms, but still the responsibility of the seller are not including terminal handling charges but it is included on buyer's account. Moreover, Indonesian rubber exporters and manufacturers have a strong bargaining position to determine the terms than the buyer. This occurs because Indonesia has a strong position as the second largest exporter of rubber and the alliances between ASEAN countries, largest rubber exporters in the world, agreed to apply the same commercial terms for rubber. While the buyers commonly from tire industries and large-scale companies that dominate the rubber market.

5.1.8 Rubber Benchmark

The figure illustrates the rubber price during January until September 2016. Overall, the rubber price (especially TSR 20) is below the crude oil price. This

low price is because the rubber production growth is greater than the consumption growth. The intended production growth is the large number of new rubber production in Thailand, Vietnam, Cambodia, Laos and Myanmar as well as several countries in Africa. Meanwhile, the consumption growth is weak because of several reasons. First, the slow pace of economic recovery in Unites States and Europe. Second, the growth of consumption in China also depends on its export market, which experienced a decline, as a result the demand of rubber from China decreased. Third, the growth of world GDP is correlated with the low growth in automotive which finally brought an impact on the natural rubber and tire needs.



Sources: Singapore SICOM Rubber Price (2016)

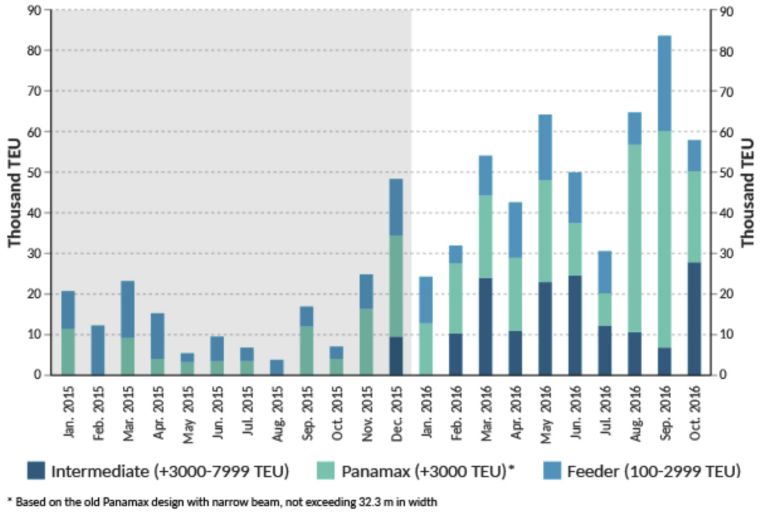
Figure 5.5: TSR 20 and RSS3 Price Vs. Crude Oil Price

5.2 Shipping Market

5.2.1 Ship Type

On the basis of products, liner shipping is the service of transporting rubber by means of high-capacity, ocean-going ships that transit regular routes on fixed schedules. Liner vessels, primarily in the form of container ships have become the preferred transportation mode for many shippers in markets including USA, China and Japan, which imports more than 1,300 thousand tons or one half of total volume of Indonesian rubber. For most importer countries, containers provide flexibility, reduced damage, and low rates for rubber shipments.

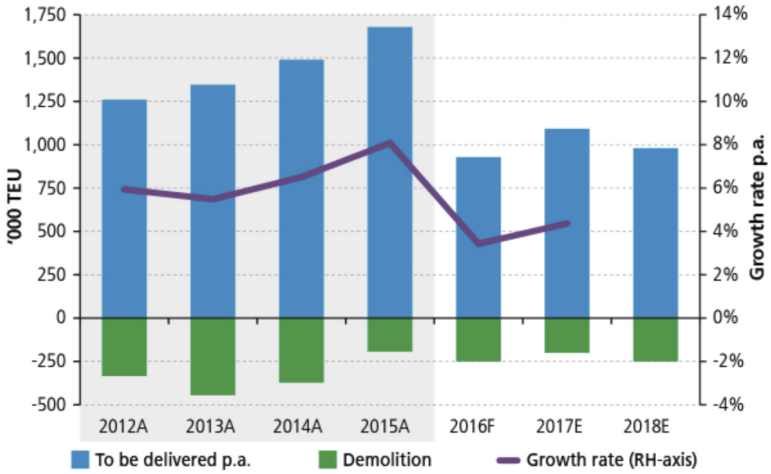
In terms of number of ships used, overcapacity of global container ship continues to claim casualties and force industry consolidation; shipowners are scrapping younger and younger vessels. For instance, Diana Containerships



Sources: BIMCO, Clarksons

Figure 5.6: Container Ship Demolition Activity

announced that it was scrapping a 10-year-old vessel, one of the youngest ever. Moreover, Peter Sand, BIMCO's Chief shipping analyst, said that it is important that the demolition of excess capacity comes sooner rather than later, as there is still a huge delivery schedule hanging over the container shipping industry for the rest of this year and well into 2017-2018. Figure 5.6 illustrates the demolition of container ship in the last two years. The demolition of Panamax containerships in TEU accounts for 47 % of the total demolition in 2016, while TEU scrapped from Intermediate and feeder containerships account for 30% and 23% respectively.



Sources: BIMCO, Clarksons

Figure 5.7: Container Supply Growth

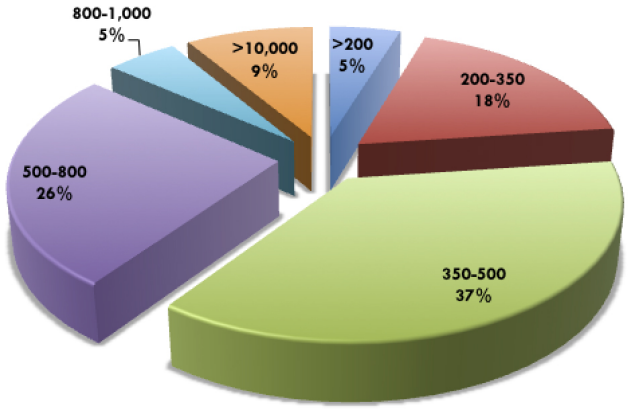
With regards to a new contracting activity, no orders have been agreed in 2016.

This is the first time since Q2-2009 that three months have passed without any new orders signed. The lack of orders reflects the very poor market conditions. In 2016, the average containership size for delivered ships is going down from the all-time-high of 7,952 TEU in 2015 to around 7,000 TEU per ship.

5.2.2 Indonesian Fleet Availability

One of the objectives of this study is to evaluate the availability of Indonesian fleet to potentially offer the service to replace foreign-flag vessels. Therefore, we present the availability of Indonesian fleet for container ship.

According to Indonesia Port Corporation (IPC) Report, there are 212 container vessels with a total nominal capacity of 110,220 TEU. The most common vessel size is within the range of 350 to 500 TEU, this range accounted for more than 37% of total number of vessel deployed.



Source: Modified from IPC Report (2012)

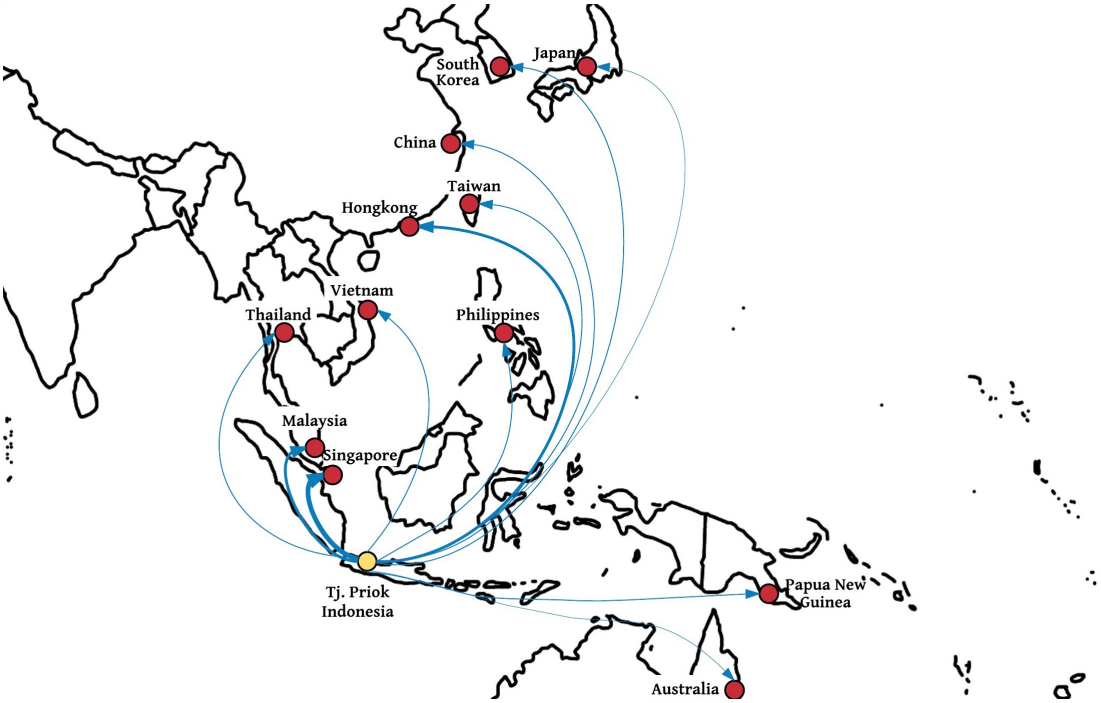
Figure 5.8: National Container Fleet by Size (TEU)

It is interesting to note that the majority of national container fleet has a carrying capacity less than 1,000 TEU on a number of their services and it can be categorized as small container ship. These small vessels commonly serve domestic or inter-island shipment. This condition indicates that national vessels still focus on domestic purposes and Indonesia is still lack of container vessels with larger capacity for transporting export cargoes.

5.2.3 Shipments of Indonesian Rubber

Rubber transportation is commonly carried out as containerized products with direct shipment or transshipment point. Direct shipment occurs when a vessel carries the cargo on one shipping service from port of origin directly to port

of destination. Meanwhile, transshipment takes place when a cargo, which is transported by a vessel, stops to an intermediate port to be moved in another vessel. For instance, Figure 5.9 shows Indonesia's largest container port at Tanjung Priok, which handle 70% of Indonesia's total import and export flow and is expected to exceed its capacity of 5 million TEU in 2012. Moreover, this port also represents the shipment of rubber products because rubber's manufacturers are mostly located in West Indonesia. The common intermediate port or transshipment points to deliver Indonesian rubber are generally in Singapore and Malaysia. This transshipment point is usually use for delivering containerized rubber products with long haul such as shipment to the USA, which typically use a larger vessel or mother vessel. Furthermore, the figure also shows several direct shipments to Asian continent and Australia. It should be noted that foreign vessels still serve almost all this export shipments, which can be seen at the figure below:

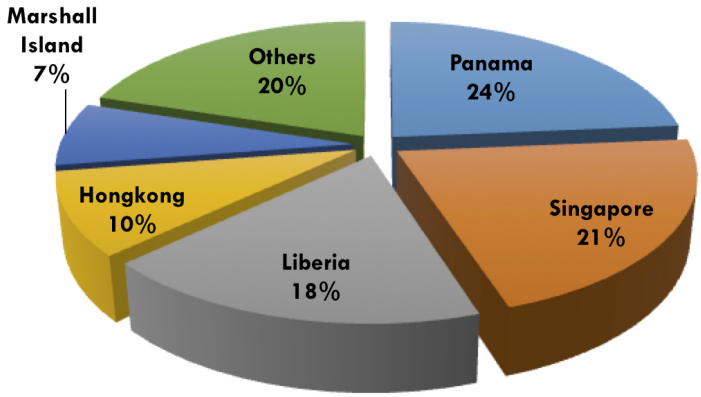


Modified: Central Bureau of Statistics of Indonesia (2012)

Figure 5.9: Direct and Transshipment Shipment of Container

Figure 5.10 shows the five biggest flag states of container for Indonesian export in sequence are Panama, Singapore, Liberia, Hong kong and Marshall Island. The proportion of container used for Indonesian export based on the flag states were dominated by Panama and Singapore flag states, which accounted for 24% (488 shipments) and 21% (441 shipments), respectively. Followed by Liberia flag state with 18% or 73 shipments, Hong kong with 10% or 97 shipments and Marshall Island with 7% or 151 shipments. While other flag states commonly are Thailand, South Korea, Antigua and Cyprus. From the big five flag states, there are three countries that implement Flag Of Convenience (FOC), such as

Panama, Liberia and Marshal Island with the total proportion of 49% of total ships used.



Sources: Central Bureau of Statistics of Indonesia (2012)

Figure 5.10: The Five Biggest Flag States for Indonesian Container Export

5.3 Evaluation of Shifting ToD

As already stated in Section 5.1, Rubber is always shipped in container, therefore, evaluation of shifting ToD is conducted by applying common characteristics of container shipping.

In order to evaluate the shift of ToD from "Traditional FOB" terms to CIF for rubber commodity, firstly we should consider several conditions:

1. The common type of vessel to shipment of rubber is container ship and the average volume of rubber is 30-40 TEU per shipment. This indicates that the rubber shipment will never reach full container load, even for the smallest size of container ship (200 TEU). Therefore, cargo consolidation with other commodities is needed to make one shipment. However, this calculation does not count for other commodities, because it is out of the scope of work.
2. From a market structure point of view, it is argued that container market is approaching perfect competition markets, where the price (freight rates) is very sensitive and difficult to control (definitely depends on the market).

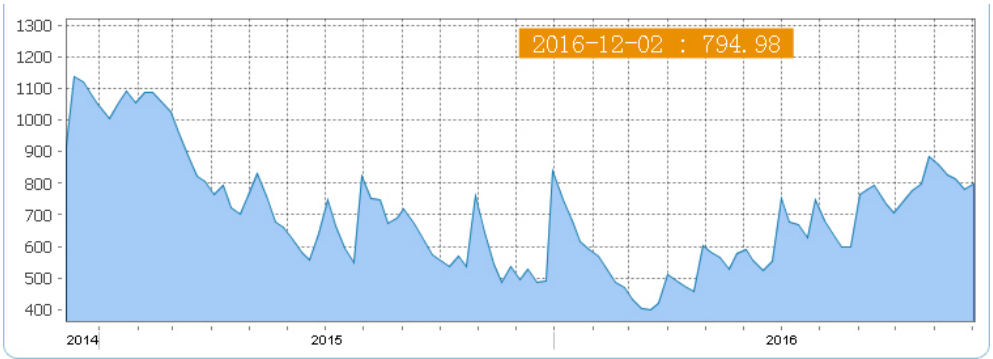
Because of these reasons, the evaluation is conducted with the help of the freight index, published freight rates and freight calculator that already exist from valid and trusted sources. First, we need to verify that the published freight rates and freight from the freight calculator is similar and represent the container freight market condition.

Verification of Freight

1. **Freight Index**

   The demand for container shipping is really not going anywhere at the moment. Indicators for growth in the first months of 2016 point to limited overall demand and huge variations from trade to trade. Volumes going into Europe from Asia dropped 6.8% in January until February 2016 from the year before, according to Container Trade Statistics (CTS). It is not merely the volumes via transshipment that used to go into Russia, which caused the volumes to drop. Mainland Europe demand continues to be weak in itself. In 2015, volumes transported from Asia to Europe dropped by 3.6%. Out of that, volumes going specifically to Russia dropped by 24.2%.

   Head haul TEU-miles globally were down 1.2% in January until February 2016 (as measured by Sea Intel) compared to the year before. A similar negative development was seen in 2013, whereas 2014 and 2015 saw sailing distances grow faster than underlying TEU demand.



Source: Shanghai Shipping Exchange

Figure 5.11: Shanghai Containerized Freight Index

   This drop in demand for container shipping was also reflected in freight rates on all the container routes out of Shanghai covered by the Shanghai Shipping Exchange. Nearly all of the head haul freight rates sit at their lowest levels on record by mid-April. Both trades going to US east coast and west coast are 50% below a six-year average for April. For Shanghai to Europe it is slightly worse. The exceptions are to destinations in East Japan and Santos, where rates are above the 2015-level but still below the six-year average.

2. **Published Freight**

   Inline with the container freight index, liner shipping has had a torrid time so far in 2016 with the freight rate volatility reaching unprecedented levels. Meantime, main importing countries of rubber are USA, Japan, China, India and South Korea. On those five routes, there is one route that

represents the export rubber products to Japan as the second biggest importer. These actual rates generally remain in the range of US$300-600/ TEU, but now it is reached the bottom line of the freight at approximately US$310/ TEU. This indicates that the real freight rate is probably way to represent the actual freight rates. In conclusion, the volatility in freight rates remains a very high as long as over-capacity and carrier industry are instability continually.

3. **Freight Calculator**

   Freight calculator is an online tool for calculation distances and shipping rates between sea ports. The distance depends on the length between origin and destination port. The assumption of origin port is Port of Tanjung Priok, Jakarta, Indonesia; whereas the destination port depends on every importing country. The destination port is assumed by the highest shipment of container. Figure (5.5)shows freight rates of five biggest importing countries of rubber.

Table 5.5: Container Freight Rates from Indonesia to Main Importing Countries

Origin	Destination	Distance (Nm)	Freight ($/TEU)	Freight ($/TEU.Nm)
Tj. Priok Indonesia	Los Angeles, USA	7,899	1,700	0.22
	Tokyo, Japan	3,234	320	0.10
	Huangpu, China	1,859	299	0.16
	Mumbai, India	2,708	542	0.20
	Busan, South Korea	2,839	247	0.09

Modified: World Freight Calculator (November 2016)

From information from freight index and published freight, these sources indicate that container freight is in the bottom line. As mentioned in published freight, the freight rate from Indonesia to Japan is US$310 /TEU and freight rate from freight calculator is US$320/ TEU. The error of calculated freight with the published freight is only 3%. Since this error is relatively small, we are confident to use this freight calculator in this study to calculate the potential freight.

Potential Freight for Indonesian Shipping Services

Potential freight means estimated freight for Indonesian shipping services from export transaction regardless the terms of delivery that is used (either with FOB or CIF terms). This section provides estimated freight of rubber export shipment from the five biggest importing countries, which is USA, Japan, China, India and South Korea.

To define the potential freight for each importing country, we assume that the verified freight calculator above could represent the actual potential container freight. Meanwhile, the freight is based on full container load (FCL) shipment with dry container in TEU (consist of 20 ton rubber/TEU). Therefore, the result of potential freight is as follows:

Table 5.6: Potential Freight for Rubber

No.	Importing Country	Volume Export (ton/year)	Freight (US$/year)
1	USA	624,700	53,099,500
2	Japan	425,000	6,800,000
3	China	289,500	4,328,025
4	India	204,500	5,541,950
5	South Korea	182,800	2,257,580
Total		**1,726,500**	**72,027,055**

Table (5.6)shows estimated freight for rubber commodity. This means that Indonesian shipping service has a potential freight around US$72,027,055 in 2015. This potential freight presents about 66% of the total volume of rubber export (2,629,900 ton) and represents around 2% of the total FOB value, which consists of rubber price, freight and insurance.

This potential freight for rubber proves that Indonesian shipping service has an opportunity to serve this export shipment, where currently foreign vessels are serving those countries. Nevertheless, shifting the ToD from FOB to CIF should firstly look at the condition of national container fleet from quantity, quality, compatibility and reliability. From this analysis, national shipping companies must have at least 86,325 TEU of dry containers to serve rubber export shipments to the five biggest importing countries.

According to Indonesia Balance of Payment (2016), Indonesia was facing a total deficit of US$ 8.29 billion in 2015 and almost 74% deficit came from transportation service. Overall, this potential freight for rubber export has a potential to reduce the total deficit around 0.87%.

Response of CIF Implementation

Based on interviews and observations, Gapkindo (Indonesian Rubber Association), on behalf of the exporters or sellers, reveal that the shift of FOB to CIF is suitable for certain commodity where its market segments is a seller's market and not buyer's market. Since the early 1970s, the majority of rubber exports has been using FOB term. In other words, a CIF term is not really suitable to be applied for the rubber commodity because Indonesian rubber market (including Thailand and Malaysia) is a buyer's market, which has a less bargaining position.

Furthermore, FOB is more efficient for exporters as a seller because of several reasons. Firstly, when the goods are already on the vessel (on board), the seller can immediately receive the Bill of Lading (B/L) and ask for payment to the buyer. Secondly, the buyers appoint the vessel; this means that if there is a delay in the arrival of the vessel then the risks are borne by the buyer itself. Thirdly, the exporter's responsibility of the goods is until the CFS (Container Freight Station) or warehouse in the port of origin, which is appointed by a shipping party.

The Indonesian rubber exporters emphasize the transition from FOB to CIF is including the transfer of its responsibilities that could incriminate the exporters because they are automatically responsible for the goods shipped till the destination country. This transition also brings more risk to the exporter. For instance, if they made some mistakes when choosing the vessel then the security and safety of the goods are threatened. In addition, there is also an immense concern about inadequate national fleet that resulting in frequent delays.

The exporters have argued that CIF term will weaken the competitiveness of Indonesia's rubber in the international market:

- Bargaining position of ocean freight from sellers is very weak (higher freight) and as a consequence it will be hard to compete in the global freight market. In terms of the ocean freight, buyers have a great bargaining position due to the large volume of rubber to be transported per shipment, so that the shipping company could provide a cheaper freight in contract of carriage because they shipped a large volume. Moreover, there are typical buyers who have purchased the representative office in Singapore to buy rubber from ASEAN countries.
- When the seller offers the higher freight, it will automatically increase the price of goods offered to the buyers. In this case, the buyer can certainly shift their purchases to other countries such as Thailand, Malaysia, Vietnam and Cambodia; where there is no government regulation about the use of CIF in those countries. In addition, big companies or buyers also supported with representative office to facilitate their purchasing activities in Singapore.
- Because the insured volume by the seller is much smaller than the insured volume by the buyer, so that the seller will bear the higher cost of insurance. The consequence of this expensive cost of insurance will weaken the competitiveness.
- Under a CIF term, the most disadvantages situation for sellers is a cash flow disruption and delay since the buyer will make payments when the goods have arrived at the port of destination; where the three biggest buyers are China, America, and Japan.

In spite of that Gapkindo stated that Indonesian government should solve those problems before shifting the Incoterms from FOB to CIF with these following approaches:

- Empower the National fleets to allocate the container vessels for export shipment.
- Provide an incentive to shipping companies to prepare the vessel for international shipment, such as completing or updating the classification requirements.
- Regarding the cash flow issues, government should have a solution to cover the interest rate of Indonesian bank until it can produce a competitive rate with other interest rates in importing country. This action will encourage the seller to apply a CIF term because they can bear the cost of money for 30-50 working days (depends on the destination port) until the buyer makes the payment of the goods.

5.4 Summary

1. Indonesian rubber is commonly exported by "Traditional FOB" system, which is different from FOB in Incoterms. Traditional FOB is similar with Free Alongside Ship (FAS) in Incoterms, where the seller delivers the goods alongside the vessel (e.g. on a quay for container) nominated by the buyer, not on board. In addition, other biggest rubber exporter such as Thailand and Malaysia also apply FOB term instead of CIF term. Hence, it indicates a difficulty to shift the existing term into CIF especially for rubber commodity.
2. In terms of value and volume, Indonesia is the second world's largest exporter for natural rubber after Thailand. Based on the data, majority of exporting countries are using FOB term and the shift ToD into CIF term in Indonesia will be implemented only if the big players apply the CIF term as their primary ToD for international trade of rubber.
   Moreover, the main importing countries of Indonesian rubber are USA, Japan, China, India and South Korea. The type of rubber exported to these countries is TSR-20, which usually used as a core material for producing a tire.
3. The type of ships commonly used to transport rubber is container ship and the average size of ship required is 7,000 TEU. On the basis of products, liner shipping is the service of transporting rubber by means of high-capacity, ocean-going ships that transit regular routes on fixed schedules. The findings depict that major Indonesian rubber products are delivered with direct shipment or transshipment. Ocean-going container vessels with foreign-flag serves both of the shipments. Yet there is no direct shipment by using Indonesian-flag vessels to serve the Indonesian rubber export to the main importing countries.
4. Potential freight of Indonesian container shipping to export Rubber is around US$ 72.1 million in 2015. This potential freight presents about

66% of the total volume of rubber export (2.63 million tons) and represents around 2% of the total FOB value. Moreover, this potential freight also has a potential to reduce the total deficit around 0.87%.

5. Response of CIF implementation:

   a) Shifting ToD from FOB to CIF will affect on the higher freight. Thus, it has consequences not only on the international market but also on the rubber farmer. By charging the higher freight, it will make the rubber market more competitive especially among neighbor countries. If Indonesia could not compete then it would be threat the rubber industries, included the farmers.

   b) Regarding the cash flow issue, if the shifting ToD into CIF is implemented, meaning that the seller should cover all of costs incurred during exporting the rubber. Almost rubber sellers have a big problem to manage their cash flow. That is why they prefer to use FOB rather than CIF, because they do not have to handle the transportation cost for exporting the rubber.

   c) Indonesia has around 28% of global market share, which is very weak of bargaining position on the global rubber market. It indicates that either rubber industries or rubber sellers are not ready to face the shifting ToD into CIF. If it is imposed on them, it will make they leave this business immediately.

6 Shrimp

This chapter deals with the evaluation of shifting ToD from FOB term to CIF term especially for Shrimp. As we did in Chapter 5, this chapter firstly introduces an overview of shrimp industry in Indonesia, followed by current market condition of Shrimp. Analysis of the current market condition will be conducted not only from supply side, but also from demand side. Analyzing from supply side will include production capacity and the importance of shrimp in term of export on the overall Indonesian export basket. Meanwhile, from the demand side, the global market share of Indonesian shrimp will be elaborated as well as the main importing countries.

In the second section, we discuss the shipping market condition of shrimp transport both for Indonesian and global market. The common types and sizes of ship used in transporting shrimp will also be presented.

In the third section, we present the evaluation of shifting ToD of shrimp from FOB term to CIF term. The evaluation is conducted by comparing the existing ToD of shrimp in FOB term with the calculated CIF term.

This chapter ends with concluding remarks containing a summary of the previous sections.

6.1 Commodity Market

6.1.1 Shrimp Industry in Indonesia

Indonesia is the world's second largest seafood producer and a major player in the shrimp sub-sector, with around 1.7 billion US$ in annual shrimp exports in 2014. The country's 34 provinces encompass thousands of islands home to artisanal and industrial fisheries, as well as small and large scale aquaculture operations. There is two shrimp species dominate shrimp farming in Indonesia: the giant tiger prawn (*P. monodon*) and white-leg shrimp (*L. vannamei*).

Figure 6.1: Shrimp Supply Chain

Regarding to shrimp supply chain, there have been a few value chain studies on Indonesian shrimp (NACA, 2006; IFC, 2006; Development Alternatives, 2006; Oktaviani et al. 2007). Overall, the supply chain begins with the fry (shrimp larvae) then supplied upstream to the aquaculture operators was collected from open coastal waters or from ponds. Families or small businesses operate the majority of aquaculture ponds on relatively small land areas and only a few big companies operating in this node of the supply chain. Once the shrimp has fully matures in the aquaculture ponds, they are harvested and sold through local trade for further processing.

In local trade, farmers are connected to processors either directly through auctions or sometimes through traders. Some farmers supply shrimp directly to processors and exporting companies, wholesalers and retails outlets. The bulk of globally traded shrimp is exported in whole or with minor processing. However, as consumer demand has evolved in the main markets, consumers conduct i.e. the USA and Japan, more and more processing prior to exporting to allow easy use of the frozen goods. This further processing refers to peeling and deheading and cutting. Then the shrimp is frozen and shipped to export market[17].

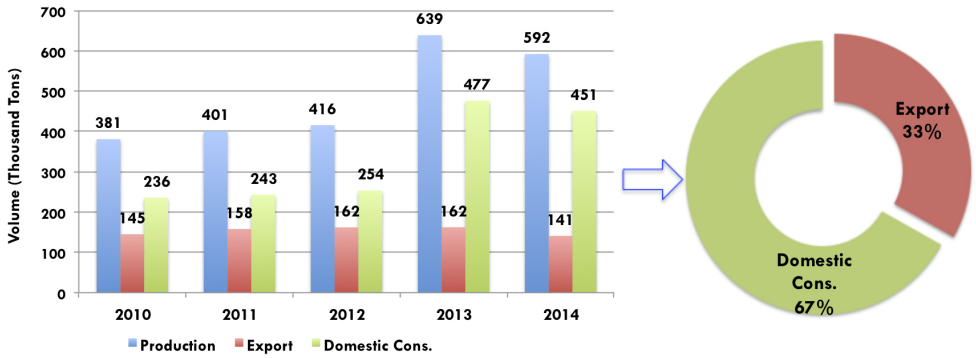
6.1.2 Production of Shrimp

A particular hub for shrimp aquaculture stretches from the southern tip of Sumatra Island through Java Island to the Lesser Sunda Islands—this arc contains the four highest producing white-leg shrimp aquaculture provinces of West Java, Lampung, East Java, and West Nusa Tenggara. Meanwhile, East Kalimantan, North Kalimantan, South Kalimantan, South Sulawesi and East Java harvested giant tiger shrimps.

Figure 6.2: Indonesian Aquaculture and Wild Shrimp Resources

In the period of 2010-2014, total aquaculture production increased from 380,972 tons in 2010 to 638,955 ton, valued at 1.4 billion US$ in 2013[5], with an average growth of 13% per year. This growth was the result of innovations in

technology, expansion of aquaculture area and availability of suitable quality fish seeds. The graph below shows total aquaculture production in Indonesia according to Directorate General of Aquaculture Fisheries data:

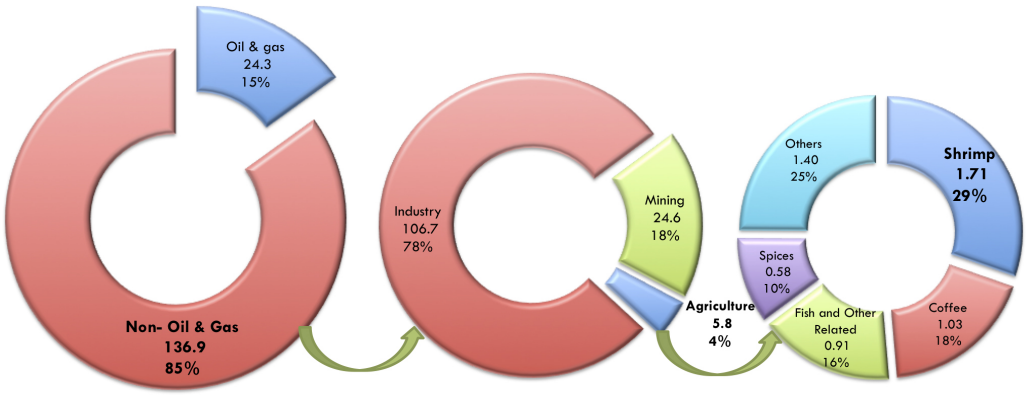


Sources: Directorate General of Aquaculture Fisheries (2014) [5]

Figure 6.3: Indonesian Shrimp Production, Export and Domestic Consumption (White-leg Shrimp and Giant Tiger Shrimp)

At the beginning of the period, the volume of export lower than for domestics consumption, standing at 145 thousand tons compared to 236 thousand tons for domestic consumption. From 2010 to 2012, both export and domestic consumption increased steadily. Over the next two years, the volume of export decreased quite considerable, dropped around 21 thousand tons by 2015. Meanwhile, domestic's volume far exceeded that of export, reaching at a massive 451 thousand tons in 2015.

6.1.3 Indonesian Shrimp Export



Source: Modified from Central Bureau of Statistics of Indonesia (2015)

Figure 6.4: Indonesian Export Commodities by Sectors (value in billion $)

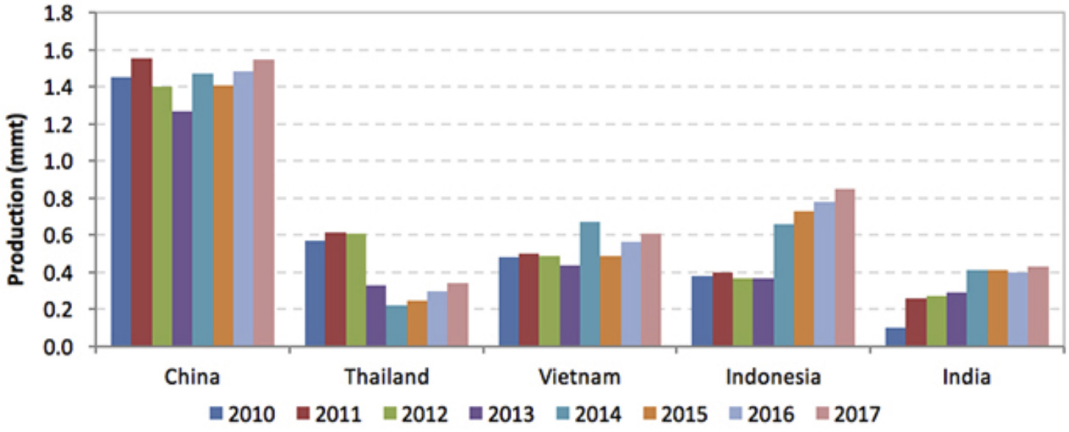
In 2015, Indonesia's farmed shrimp represented the single greatest contributor to Indonesia's agriculture export earnings with about US$1.71 billion or 29% from the agricultural export products. From the five-farmed shrimp varieties in Indonesia, white-leg and giant tiger shrimps are the two primary species grown for the export market [10]. Meanwhile, the second largest export from agricultural products is coffee, followed by fishes and spices.

On the other hand, the volume of Indonesian shrimp exports has held fairly steady over the past decade, with a peak of 140,800 ton exported in 2008, which is not much higher than the figure for the most recent year of available data (forecasting result in 2015: 141,546 ton exported). The total volume of shrimp exported in 2015 was very small below than one percent of the total export basket of Indonesia.

6.1.4 Global Market Share

Shrimp production grew steadily in Asia through 2011, an average of 7% annual growth rate from 2006 to 2011 (Figure 6.5). Production in 2012 declined to 3.4 million ton (down 5% from 2011) due to the impacts of early mortality syndrome (EMS) or acute hepatopancreatic necrosis syndrome in China, Thailand, Vietnam and Malaysia. According to the survey respondents, production in Asia fell 21% in 2013 to around 2.7 million ton, with the most substantial declined taking place in China and Thailand [2]. Although production in China was expected to recover in 2014 from 1.1 to 1.2 million ton, output in Thailand was expected to decline even further to 200,000 million ton, with an eventual partial recovery in 2015. Productions in Vietnam, Indonesia and India are expected to increase steadily between 2013 and 2016, with Vietnam and India are achieving double-digit growth rates. In 2016, Vietnam, Indonesia, India and Bangladesh are expected to reach production of 590,000; 450,000; 395,000 and 107,000 ton, respectively. Thailand could drop from second to fifth place in the region, by producing 328,000 million ton in 2016. Output in China is expected to reach 1.3 million ton in 2016, 16% below the record quantities achieved in 2011. These forecasts assume that impacts from diseases are reduced to manageable levels.

Despite global uncertainties and sluggish global growth, Susi Pudjiastuti, Indonesia's Minister of Maritime Affairs, is optimistic about growth of Indonesia's fishery sector in 2016 as the central government has earmarked IDR 13.8 trillion in the 2016 State Budget for the Maritime Affairs Ministry, up to 31.4% from the allocation in the 2015 State Budget. Pudjiastuti said the country's fishermen will be prioritized when spending these funds [6]. Moreover, exports of shrimp and other fishery products are also estimated to rise due to the start of the ASEAN Economic Community (AEC) in 2016.



Sources: FAO (2009-2012) and GOAL survey (2013-2016).

Figure 6.5: Global Market Share of Shrimp Aquaculture in Major Farming Nations in Asia[10]

6.1.5 Ports of Export

Based on Directorate General of Aquaculture Fisheries, every species has its specific place for production. West Java is the biggest export of giant tiger shrimp by 28% of the total export. Followed by South Sulawesi by 13% of the total export. The other provinces were much smaller. Central Sulawesi, East Java and East Kalimantan brought in 9% each of overall shrimp production.

Moving on to white-leg shrimp, Lampung and West Nusa Tenggara produced similar amount of white-leg by 19.5% and total counted around 38% of total production for both provinces. East Java contributions, which were the third largest production source, brought by 13% of overall production. This was followed by South Sumatra and West Java around 20% in total. Other provinces such as Central Java, West Kalimantan, South Kalimantan, North Kalimantan, Gorontalo and Maluku making up the remaining of 39% combined.

Table 6.1: Port of Export for Indonesia's Giant Tiger Shrimp by Volume

Name of Port	Province	Volume (thousand ton)	%
Tanjung Priok	West Java	34.5	28.1%
Soekarno-Hatta	South Sulawesi	16.0	13.1%
Pantoloan	Central Sulawesi	11.8	9.7%
Tanjung Perak	East Java	11.0	9.0%
Samarinda	East Kalimantan	10.8	8.9%
Others		38.4	31.3%
TOTAL		121.7	100%

Source: Modified from Directorate General of Aquaculture Fisheries (2014)

Although these provinces have a great potential to produce shrimp, not all shrimp for exports from its province port because the shrimp needs further

Table 6.2: Port of Export for Indonesia's White-leg Shrimp by Volume

Name of Port	Province	Volume (thousand ton)	%
Panjang	Lampung	78.9	19.5%
Lembar	West Nusa Tenggara	76.8	19.0%
Tanjung Perak	East Java	52.9	13.1%
Tanjung Api-api	South Sumatra	39.7	9.8%
Tanjung Priok	West Java	39.4	9.7%
Others		115.5	28.6%
TOTAL		403.4	100%

Source: Modified from Directorate General of Aquaculture Fisheries (2014)

processing in other areas and then shipped to main container port in Indonesia. Most export products pass through the two main ports which are Tanjung Priok (Jakarta) and Tanjung Perak (Surabaya). Meanwhile, shrimp products in Sumatra Region sometimes directly go to Port of Belawan and shrimp products in Sulawesi Region often go to Port of Makassar.

6.1.6 Main Importing Countries

Table 6.3 shows the main export destination countries for Indonesian shrimp such as USA, Japan, China, Malaysia and Singapore. In Indonesia, farmed shrimp represents the single greatest contributor to Indonesia's aquaculture export earnings (29%). From the five farmed shrimp varieties in Indonesia, giant tiger and white-leg in particular are the two primary species grown for the export market.

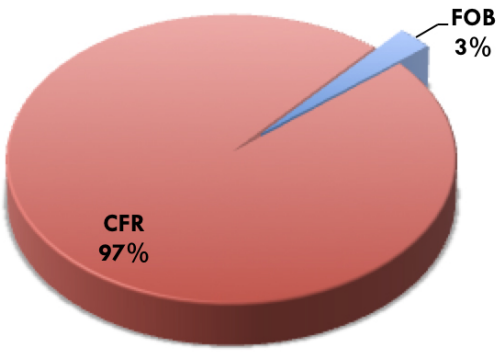
Table 6.3: Top Five Importing Countries of Indonesian Shrimp by Volume

Importing Country	Volume (thousand tons)	%
USA	85.8	58%
Japan	27.5	19%
China	5.5	4%
Malaysia	4.0	3%
Singapore	3.4	2%
Others	22.0	15%
TOTAL	148.5	100%

Source: Modified from Central Bureau of Statistics of Republic Indonesia (2015)

Overall, the most significant importing countries of shrimp were USA and Japan, which together accounted for almost 75% of the total shrimp export proportion. In the meantime, China, Malaysia and Singapore and other countries were only took a few proportion over this year.

6.1.7 Existing Terms of Delivery



Sources: Indonesian Fishery Product, Processing and Marketing Association (2016) [15]

Figure 6.6: The Proportion of Existing Terms of Delivery

Shrimp exporters prefer to select ocean vessel as a mode of transport, as it is one of the cheapest and most convenient ways to ship shrimp overseas. Different from previous study for crude palm oil and coal commodities, the common Terms of Delivery used by Indonesian shrimp exporters is CFR (Cost and Freight). Shrimp sellers arrange and absorb the cost of shipping their cargo to the port of destination using CFR terms for about 97% of total export shipment. There are several example of company, which use this CFR terms, such as PT. Wirontono Baru, PT. Winaros Kawula Bahari, PT. Madsumaya Indo Seafood, PT. Bumi Menara Internusa, PT. Kalimantan Fishery, PT. Suri Tani Pemuka, PT. Alter Trade Indonesia and PT. Istana Cipta Sembada [15].

On the other hand, Indonesian Fishery Product, Processing and Marketing Association (AP5I) emphasizes that the seller was confused when stated the ToD in Export Declaration (*Pemberitahuan Ekspor Barang/ PEB*). They only write the FOB price because there is no column to state the freight in the Export Declaration paper when they use CFR or CIF terms. This misunderstanding made Directorate General of Customs and Excise did a wrong record about the terms that is used in the real transaction. Budhi Wibowo, AP5I Chairman, suggest the government to modify the Export Declaration in order to discover the freight and prevent misunderstanding in the government's record.

Figure 6.6 shows a common term used by the seller is CFR and only around 3% utilizing FOB terms of the total terms. There are several reasons why the minority sellers still apply FOB term instead of CFR term:

- Seller are dominantly new exporters who are less experience on international trading. They do not really understand about the use of Incoterms, so that they choose to avoid the risk of ocean freight.
- Buyers are companies that have a special freight rate (lower than the freight market), therefore they have a power to manage the export shipment by themselves.

- Buyers generally have a branch office (representative office) in Indonesia, thus there is no difficulty in taking care of their shrimp export activities.

6.2 Shipping Market

6.2.1 Ship Type

On the basis of products, shrimp product is transported with liner service because the shipment is in a small amount and fixed schedules. A type of ship typically used to transport perishable commodities is container ship with a temperature-controlled system.

According to AP5I, Indonesian shrimp product is transported in reefer containers and almost 90% of shrimp is processed into frozen fishery products. Every year, as a part of fisheries products, shrimp contributes a high proportion of these frozen products to enter international trade through sea transport.

In Indonesia, big companies export approximately 10 - 20 container boxes per month, while smallholders or farmers are supplying their shrimp to these big companies. Before the shrimp is transported overseas, firstly it should have a right packaging method according to buyer's provision. There are two common methods to ship the shrimp as packaged frozen products; they are block frozen and Individual Quick Frozen (IQF). Block frozen means the shrimp are placed on plate freezer frames (metal frames), water is poured in and the shrimp are frozen in blocks. However, as every 2 kg of the block-frozen products require 1 kg of water, nearly 34% of the weight of the product is due to the water. While the packaging for the block frozen product consists of master carton and inner carton. Inner carton of appropriate size for packing 2 kg of shrimp and six inner cartons shall be placed in one master carton. Inner cartons must be free of damage, sealed at all edges and free of all extraneous matter and odors. Master carton shall be durable in strength in order to withstand normal handling during shipment.

Meanwhile, IQF means the shrimp were not frozen in a big block of ice and are more likely to have better flavor and texture, and the shrimp has been peeled or cleaned. IQF method requires about 0.05 kg of water per 1 kg of product. IQF product is a conveniently packaged with 1-2 kg per packaged. Similar to block frozen product, every 10 packaged (10-20kg) of this frozen product shall be placed in one master carton and each master must be plainly marked by its manufacturer's name and detail of the shrimp product.

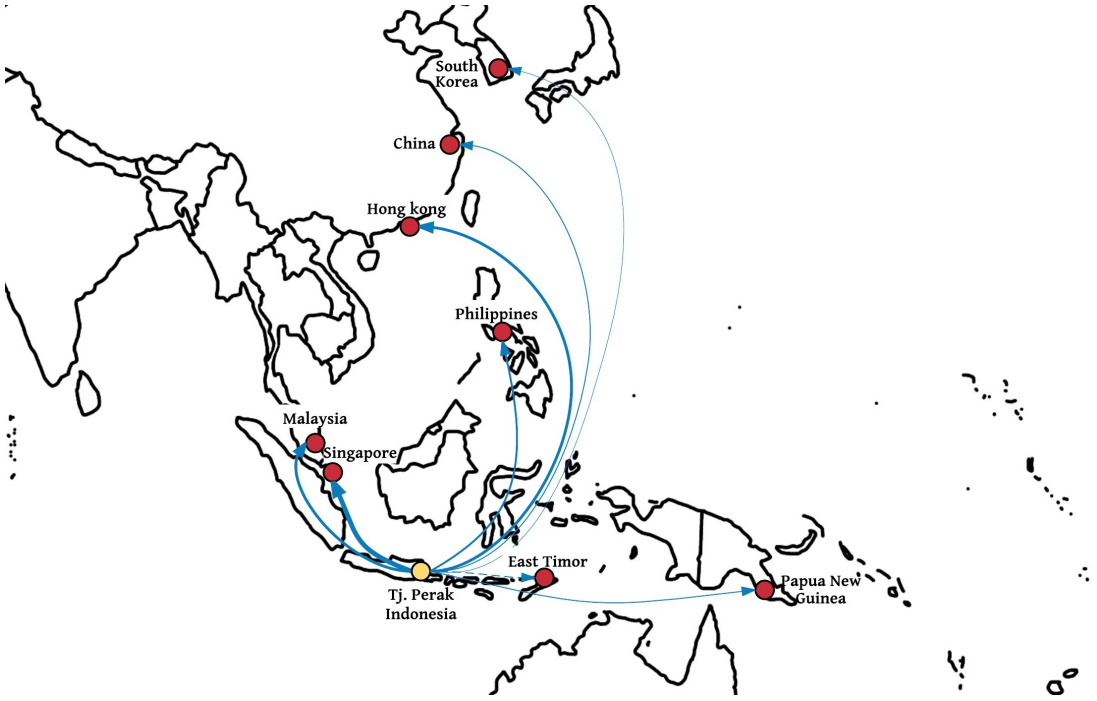
After packaging process is done, shrimp can be transported both with FCL (Full Container Load) or LCL (Less Container Load) shipment; it is totally depended on the volume to be shipped by the seller. Normally big companies use FCL because they have sufficient product to fit with its container volume, while LCL enables smaller sellers, such as small and medium enterprises, to ship smaller

amounts of product that is not of a large enough volume to make FCL a viable option.

6.2.2 Indonesian Fleet Availability

One of the objectives of this study is to evaluate the availability of Indonesian fleet to potentially offer the service to replace foreign-flag ships. As we know that shrimp product is delivered with reefer container, so that the ship type is container ship but with special space to carry a reefer container. As described in Section 5.2.2, national container ships mostly have small size and transport cargoes for domestic purposes rather than for international shipments. This condition specified that there is limited national reefer container and insufficient size of ship in order to carry reefer products.

6.2.3 Shipments of Indonesian Shrimp



Modified: Central Bureau of Statistics of Indonesia (2012)

Figure 6.7: Direct and Transshipment Shipment of Container (Origin: Tanjung Perak)

Shrimp product is exported by container vessels, thus it has similar shipment term with rubber commodity. This container vessel serves both direct and transshipment shipments. This transshipment generally does to combine small shipments from Indonesia into a large shipment (consolidation) with larger size of

container vessel. Figure 6.7 shows direct and transshipment shipments from Port of Tanjung Perak, Surabaya, which is the biggest container port in Eastern Indonesia. This shipment can be assumed to present the shipment of shrimp products because most of shrimp companies and industries are in Eastern region of Indonesia. Overall, the major shipment to export shrimp product is through transshipment point in Singapore and Malaysia. Meanwhile, other destination countries such as China, South Korea and Philippines are identified as direct shipments.

Currently, all container shipments are served by foreign container vessels. If there is a direct shipment of shrimp commodity from Indonesia to main importing countries, so that national fleet has an opportunity to serve this shipment with similar route of export. Nevertheless, this national fleet should firstly meet the international shipping standard such as statutory regulations and ship's classification. Furthermore, the shrimp product is shipped with reefer container. In addition, not all container vessels can transport container reefer because of the limitation of vessel specification such as reefer plugin for electricity and its power needs. Therefore, the number of container vessels that carried reefer containers is less than the common container vessels.

6.3 Evaluation of Shifting ToD

As already stated in Section 6.1, shrimp is always shipped in reefer container, therefore, evaluation of shifting ToD is conducted by applying common characteristics of container shipping.

Similar to previous study case for Rubber commodity, in order to evaluate the shift in ToD from CFR or FOB term to CIF term for shrimp commodity, firstly we should consider several conditions:

1. The common type of vessel required to shipment the number of shrimp export is container ship and the average volume of shrimp is 10-20 TEU per shipment. This indicates that the shrimp shipment will never reach full container load, even for the smallest size of container ship (e.g. 200 TEU). Therefore, cargo consolidation with other commodities is needed to make one shipment. However, this calculation does not count for other commodities, because it is out of the scope of work.
2. From a market structure point of view, it is argued that container market is approaching perfect competition markets, where the price (freight rates) is very sensitive and difficult to control (definitely depends on the market).

Because of these reasons, the evaluation is conducted with the help of the freight index, published freight rates and freight calculator that already exist from valid and trusted sources. First, we need to verify that the published freight rates and freight from freight calculator is similar and represent the container freight market condition.

Verification of Freight

1. **Freight Index**

   As mentioned in Freight Index section on page 84, demand for container shipping is at the bottom at the moment and also affects the freight rates all the container routes. Nearly all of the head haul freight rates sit at their lowest levels on record in the second quarter 2016.

2. **Published Freight**

   Main importing countries of shrimp are USA, Japan, China, Malaysia and Singapore. On those five routes, there is one route that represents the shrimp products to Japan as the second biggest importers. For instance, the actual freight rates of reefer container from Tanjung Perak, Indonesia to Tokyo, Japan is generally US$1,000-1,400/ TEU while current condition of freight rates to Japan is US$600-1,000/ TEU, which indicates a bottoming freight almost 30% of actual freight rates.

3. **Freight Calculator**

   Freight calculator is a online tool for calculation distances and shipping rates between sea ports. The distance depends on the length between origin and destination ports. The assumption of origin port is Port of Tanjung Perak, Surabaya, Indonesia; whereas the destination port depends on every importing country. The destination port is assumed by the highest shipment of container. Figure (6.4)shows freight rates of five biggest importing countries of shrimp.

Table 6.4: Reefer Container Freight Rates from Indonesia to Main Importing Countries

Origin	Destination	Distance (Nm)	Freight ($/TEU)	Freight ($/TEU.Nm)
Tj. Perak Indonesia	Los Angeles, USA	7,899	3,739	0.47
	Tokyo, Japan	3,234	952	0.29
	Huangpu, China	1,859	830	0.45
	Tanjung Pelepas, Malaysia	615	903	1.47
	Singapore	520	860	1.65

Modified: World Freight Calculator (November 2016)

Based on the information from freight index and published freight, these sources indicate that container freight is in the bottom line. As mentioned in published freight, the freight rates from Indonesia to Japan are ranging from US$600-1000 /TEU and freight rate from freight calculator is US$952/ TEU. Since this calculated freight is between the current published freight, we are confident to use this freight calculator in this study to calculate the potential freight.

Potential Freight for Indonesian Shipping Services

Potential freight means estimated freight for Indonesian shipping services from export transaction regardless the terms of delivery that is used (either with FOB or CIF terms). This section provides estimated freight of shrimp export shipment from the five biggest importing countries, which are USA, Japan, China, Malaysia and Singapore.

To define the potential freight for each importing country, we assume that the verified freight calculator above could represents the actual potential container freight. Meanwhile, the variety of frozen shrimp products is carried by sea in reefer vessel and reefer container. These containers are mainly available as 20' and 40' containers, but the typical size for Indonesia's shrimp export is 20' reefer container (TEU) and shipped with FCL (full container load). Therefore, the result of potential freight is as follows:

Table 6.5: Potential Freight for Shrimp

No.	Importing Country	Volume Export (ton/year)	Freight (US$/year)
1	USA	85,839	16,047,601
2	Japan	27,598	1,313,665
3	China	5,531	229,537
4	Malaysia	4,071	183,806
5	Singapore	3,434	147,662
Total		**126,473**	**17,922,270**

Table (6.5)shows estimated freight for shrimp commodity. This means that Indonesian shipping service has a potential freight around US$17,922,270 in 2015. This potential freight presents about 85% of the total volume of shrimp export (148,519 ton) and represents around 1.1% of the total FOB value, which consists of shrimp price, freight and insurance. The percentage of freight rates is small because shrimp is categorized as a high-value commodity.

This potential freight for shrimp proves that Indonesian shipping service has a little opportunity to serve this export shipment, although foreign vessels are currently serving those importing countries. Nevertheless, shifting the ToD from FOB to CIF should firstly look at the condition of national container fleets from quantity, quality, compatibility and reliability. From this analysis, Indonesian shipping company must have at least around 6,324 TEU reefer containers to serve shrimp export shipments to the five biggest importing countries.

According to Indonesia Balance of Payment (2016), Indonesia was facing a total deficit of US$ 8.29 billion in 2015 and almost 74% deficit came from transportation service. Overall, this potential freight for shrimp has a potential to reduce the total deficit around 0.22%.

Response of CIF Implementation

Based on the interviews conducted along with Indonesian Fishery Product, Processing and Marketing Association (AP5I), they declared that the actual use of Incoterms is a purely relationship between business-to-business (B2B). The government is expected not to intervene the commercial transaction because it will have an impact to weaken the competitiveness of Indonesia's position in the international market because the buyer can easily switch their purchasing to other exporting countries.

On behalf of all Indonesia's shrimp and other fishery products sellers, AP5I has several suggestion to government before implementing the CIF term, they are:

- Take an action to improve Indonesia's sea transportation because freight for domestic shipment is more expensive than freight for international shipment.
- Encourage and support small and medium shipping companies to operate their vessels, thus not only several big companies dominate the domestic shipping. Indeed, the number of commercial vessels have been increasing due to Cabotage's implementation, but still only big shipping companies owned the majority of the vessels, which indicate oligopoly market.

6.4 Summary

1. The common ToD to export Indonesian shrimp is CFR (Cost and Freight). In the most cases, shrimp sellers arrange and absorb the cost of shipping from origin to destination port. On the other hand, the use of FOB terms is very few compared to CFR term because of three main reasons:
    a) Seller are dominantly new exporters who are less experience on international trading. They do not really understand about the use of Incoterms, so that they choose to avoid the risk of ocean freight.
    b) Buyers are companies that have a special freight rate (lower than the freight market), therefore they have a power to manage the export shipment by themselves.
    c) Buyers generally have a branch office (representative office) in Indonesia, thus there is no difficulty in taking care of their shrimp export activities.
2. In terms of value and volume, Asia countries are the main exporting countries on global shrimp market. China is the world's largest exporter of shrimp, followed by Vietnam and Indonesia. In addition, the main importing countries of Indonesian shrimp are USA, Japan, China, Malaysia and Singapore.
   It should be noted that China is found as the main exporter and importer

simultaneously. It is caused by the total production for White-leg Shrimp in China cannot meet with the higher number of domestic consumption, whereas China's shrimp export only for the reprocessed products.

3. The type of ships used to transport shrimp is container ship. However, most of shrimp products are exported in a frozen, thus the type of container used is a reefer container.
   In addition, major Indonesian shrimp products are delivered with direct shipment or transshipment. Both of them are served by ocean-going container vessels with foreign-flag. Yet there is no direct shipment by using Indonesian-flag vessels to serve the Indonesian rubber export to the main importing countries.
4. Potential freight of Indonesian container shipping to export shrimp product is around US$17.9 million in 2015. This potential freight presents about 85% of the total volume of shrimp export (148,519 ton) and represents around 1.1% of the total FOB value. The percentage of freight rates is small because shrimp is a high-value commodity. However, this potential freight also has a potential to reduce the total deficit around 0.22%.
5. Response of CIF implementation:

   a) Shifting ToD from FOB or CFR to CIF will have consequences not only on the global market share but also on the fisherman. Because almost the shrimp exporters are new players, so by charging the ToD, it will make the shrimp market more competitive especially among Asia countries. If Indonesia could not compete then it would be threat the shrimp industries, included the fisherman.

   b) Due to the usage of container vessels, meaning that transporting the shrimp export can be served by direct shipment or transshipment. In fact, almost shrimp export products are served by foreign-flag vessels. Nonetheless, as long as there is a direct link from Indonesia to several importing countries, then there is a potential for Indonesian-flag vessels to serve the route only if these vessels can meet the international regulation.

   c) Shrimp industries or sellers are not ready to face the shifting ToD into CIF, it will make they leave this business immediately because of less bargaining position of Indonesia in the global shrimp market.

7 The Impacts on Shifting the Terms of Delivery

This chapter is added to elaborate the impacts, including pros and cons, due to shifting the term for exporters, freight forwarders, insurance firms and shipping lines. It is provided as a basic insight before formulating the recommendations.

As mentioned at the beginning of this report, this study is conducted based on the assumption that changing the Term of Delivery (ToD) from FOB to CIF of Indonesian export products will promote the Indonesian-flag vessels. Under this assumption, the beneficiaries of this shifting are not only national shipping operators but also locally established freight forwarders and insurance companies.

Nevertheless, based on the result of the calculation and interview with some "actors", there would be any Pros and Cons on this shifting ToD, as follows:

1. Pros
    a) Some proponents have argued that shifting in ToD from FOB to CIF for Indonesian export commodities with fully supported by the government policies will allow some benefit on Indonesian economy. Furthermore, this shifting could increase the participation of locally established shipping companies, freight forwarders and insurance firms.
    b) By shifting in ToD, the exporters would have an opportunity to promote national shipping industries. However, under this condition, Indonesian-flag vessels should firstly be available in terms of the quantity, quality, compatibility and reliability.
    c) In line with promoting national shipping industries, shifting ToD will encourage the Indonesian-flag vessel utilization. Meanwhile, it will simultaneously be able to stimulate the national shipyard industries.
2. Cons
    a) If the government imposes the policy of shifting in ToD from FOB to CIF, then it is feared that the policy would have a negative impact on existing international trade of Indonesia. Particularly for homogeneous products such as rubber, shrimp, textile and footwear, if Indonesia has to compete with other countries over these products, forcing the use of CIF would potentially damage these manufacturing industries.

b) If the bargaining position of Indonesian exporters is less than of foreign importers, most likely the importers will look for other exporting countries meaning that this policy will have a counter productive effect instead of allowing Indonesian exporters to demand higher prices.

c) In case where Indonesian exporters have higher bargaining position, this policy will remain a counter productive. This is due to the infirmity of domestics shipping industries, especially in terms of availability and compatibility of vessels to meet with the international regulations. In short, the shifting ToD from FOB to CIF will automatically be accepted only if national shipping industries enhance their competitiveness globally.

d) Nonetheless, the shift in Incoterm from FOB to CIF will still allow the seller to choose the carrier. The carrier may or may not fly the Indonesian-flag. In case the carrier is foreign, a transport service is still imported so the shift may have little impact. In case the carrier is domestic but using the flag of convenience, a transport service is exported and has a positive impact on Balance of Payment whereas the flag is not Indonesian.

e) In terms of insurance, the possibility of gaining the advantages from the policy of shifting ToD will definitely depend on the competitiveness of national insurance firm itself. There is no directly relation on selecting insurance firm either flag state or nationality of the vessel used on exporting Indonesian products.

f) Overall, selecting the Incoterms is totally authorization between buyer and seller. By the time being, shifting ToD from FOB to CIF will impose some industries to leave their business due to lower bargaining position in the international trading.

8 Conclusion and Recommendation

8.1 Conclusion

1. The vast majority of CPO and Coal products are shipped under Free on Board (FOB) term. Meanwhile, Rubber product is shipped under "Traditional FOB" term, which is similar with Free Alongside Ship (FAS) in Incoterms and Shrimp product is shipped under Cost and Freight (CFR) term.
2. The use of Incoterms is not always inline with the Export Declaration record (PEB). For example, the common ToD of Shrimp and Rubber on Export Declaration record was FOB. While the fact that Shrimp commodity is using CFR terms and Rubber commodity is "Traditional FOB".
3. According to Indonesian National Shipowners' Association (INSA, 2016), the composition of national fleets is dominated by barge (32.87%), tug boat (30.8%). Meanwhile the proportion of national cargo ship (including container ship, tanker and bulk carrier) is approximately 30%. Meaning that the number of Indonesian-flag vessels to serve international trade is very less.
4. In fact, the main Indonesian export products are transported with foreign-flag vessels. However, in the case of coal especially for shorter route could be served by Indonesian-flag vessels such as barge.
5. For selected commodities, which are transported by container due to a small amount of export volume such as rubber and shrimp, the price (freight rate) is very sensitive and difficult to control. It is because container market is categorized as perfect competition market. Hence, the higher freight offers on Indonesian shipping market will make buyers automatically move to other exporting countries, since there is no government regulation about the use of CIF in other exporting countries (especially among ASEAN countries).
6. Shifting the ToD from FOB to CIF has potential to increase the national income from the freight perspective. The evaluation resulted that total potential freight for selected export commodities (CPO, Coal, Rubber and Shrimp) approximately US$ 3.17 billion in 2015. The result also indicates that the biggest opportunity to implement the CIF terms is for CPO and

Coal because these commodities gave the biggest potential freight. However, shifting the ToD from FOB to CIF should firstly look at the readiness of the national fleets (Indonesian-flag fleets) in terms of the quantity, quality, compatibility and reliability.

7. Indonesia was facing a total deficit of US$ 8.29 billion in 2015 and almost 74% deficit came from transportation service. According to this fact, the evaluation of shifting the ToD from FOB to CIF has a potential to reduce the total deficit around 38.24% (from the potential freight for export amounted by US$ 3.17 billion) in 2015.

8.2 Recommendation

1. The government policy of shifting the term of delivery from FOB to CIF for Indonesian export products could lead on a counter productive effect. It would appear when the bargaining position of seller (Indonesia) is less than of foreign buyer and the commodity is categorized as homogeneous (standard) products so that the buyer can easily move to other sellers.
2. In the short term, the government firstly needs to pay more attention to improve the national maritime infrastructure in order to meet the international standard (regulation and classification) by providing an incentive to shipping companies or shipyards.
3. Under a CIF term, the sellers (Indonesian exporters) will have to deal with a cash flow disruption and a delay of shipment. Therefore, the government should have a solution to cover the interest rate of Indonesian bank until it can produce a competitive rate with other interest rates in importing countries.
4. Considering to implement the term of delivery: Cost and Freight (CFR) instead of CIF. Because a CIF term should take into account for both freight and insurance premium, while current foreign insurance company offers more competitive premium than national insurance company.
5. Indonesian export commodities that have potential to be shifted into CIF term are coal and crude palm oil. Because these commodities are main Indonesian export products and dominate Indonesian total export basket volume. Moreover, a CIF term is more applicable on tramp shipping because of the principal “one ship, one cargo”.

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