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Transportation Cost and Regional Trade Perspective: Evidence of Indonesia Logistic Performance

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Abstract
The most one important aspect of logistic performance index is tranportation cost. The transportations cost that has a first order influence on logistic indext performance. This article investigations topic about the effect of in Regional trade performance and tranportation cost side. The overall analysis suggesting specificitions data of transportation cost of port Indonesian and of ASEAN member's countries partner trading. The result of findings that the overall transportation cost /.tics performance index is positively and statistically significantly correlated with exports and imports. The analysis is also extended by investigating if logistics specificities mattered for Indonesia on Regional trading. The findings reveal that several dimensions capturing logistics performance have statistically significant and positive effect, mostly on import. The main policy implication is that continuous investment in logistics infrastructure and services can positively impact international trade.

Costo De Transporte Y Perspectiva Comercial Regional: Evidencia Del Desempeño Logístico De Indonesia

Resumen
El aspecto más importante del índice de rendimiento logístico es el costo de transporte. El costo de transporte que tiene una influencia de primer orden en el rendimiento logístico indext. Este artículo investiga el tema sobre el efecto en el desempeño comercial regional y el costo de transporte. El análisis general sugiere datos específicos de los costos de transporte del puerto de Indonesia y de los socios comerciales de los países miembros de la ASEAN. El resultado de los hallazgos de que el índice general de rendimiento de costos de transporte / estadísticas está correlacionado positiva y estadísticamente de manera significativa con las exportaciones e importaciones. El análisis también se extiende investigando si las especificidades logísticas eran importantes para Indonesia en el comercio regional. Los resultados revelan que varias dimensiones que capturan el desempeño logístico tienen un efecto estadísticamente significativo y positivo, principalmente en la importación. La principal implicación política es que la inversión continua en infraestructura y servicios logísticos puede tener un impacto positivo en el comercio internacional.

1. Introduction

The economic growth in world depends on the efficiency of trade support structures such as transportation costs and handling cost. Despited logistics integrals roles in supporting commercial activities, there has generally been a low level of analysis and regional trading research focus from trade practitioners transport and logistics services an important role in the growth of the local and regional economy. The quality and efficiency of transportation services can matter for trade as a infrastructure, services, timing and operational processes an be a major obstacle to regional trade integration (Arvis, et al., 2016)).

The generally of tranportation service of Indonesia port problem, is Port time. There are some factors cause high dwelling are dwelling time and services cost in Tj Priok Port which has an average dwelling time around 7 – 8 days (Yuliani, 2016). On the contrary, an improved trade related logistics performance, can be increasing of export and import, economies of scale, scope in distribution and minimizing operating costs (Lakshman et al. 2001; Saeed,and Fumitaka, 2015). Transport cost provide sectoral connections within the domestic economy to the regional and internation-

al trading. The efficient transport significant to strengthened through an economyc growth (Avif, 2017).

Hanssen, Terje and Jørgensen (2012) was finding transport cost and handling cost preferable increasing if (1) incrising of the handling costs at terminals, (2) total transport cost increasd, (3) distance dependent marginal generalized costs for rail increases, (4) thedistance dependent marginal generalized costs for truck decreases and (5) reduced of truck drivers costs. Song and Yeo (2017) the importer's ability to participate and benefits of the growing global trading, depends on efficient transport and handling cost that can support their international trade aliancies. Provided a inclusive analysis of air transport network of airport. The port transport sector revealed that 67 % of global trade value and emerging economic created under efficient transportations accrued to the logistic perfomance index (Banga,2014). Although, transportation cost contribution to the domestic output in a country may not be as competitive as other sectors, the role that transportation service, infrastruktur and connectivity in supporting the activities within an beneficial economy cannot be overlooked. The transportation aspect is an integral part in terms of facilitating regional trade as it allows firms to effectively complete imports and exports of goods and services and supporting to trading performance (Avif, 2017).

2. Literature Review

2.1. Logistics Performance

In the international trading, the size of the transportation sector is not clearly known. Iskandar et al, (2015) analysis of logistics data, covering Indonesian countries, revealed that, on average, the logistics sector accounts for about 24 percent of the gross domestic product (GDP). Logistic Performances Indext (LPI) of Indonesia Given the pace at which the world trade has been increasing and the contributiosn of the logistics sector to the national output in many countries is likely to accelerate as the space of trades regoonals strengthens and countries become more and more orientations members (Azmat, 2017).

The measures of LPI as based on trade logistics performance, helping national leaders, key policymakers, and private sector traders understand the challenges they and their trading partners face in reducing logistical barriers to International trading (Iskandar et al,2015; Aditiasari,2019).

Table 1: Rank of Logistic Performance Indext

Country	2014	2016	2018
Singapore	5	5	7
Malaysia	25	32	41
Thailand	35	45	32
Indonesia	57	63	46
Vietnam	48	64	39
Philippines	53	71	60
Cambodia	83	73	98

World Bank (2019)

Hence we instead calculated the proportion of the logistics rankin and transportation cost for each category.

2.2 The Transportation Concept

The transportation cost as a the guiding sense of the term, the transport meaning of an object (goods, products, cargo or commodities) from a place to another place. In the broader sense of the term, transportation means the delivery of the goods, which have been produced for the purpose of meeting the needs of the customer, to the regions and destination of origin.

Aspects of transportation costs are national and international shipping costs equipment costs, transportation distance, equipment and maintenance costs. variables related to the product (density, storage, ease or difficulty of use, insurance responsibilities. variables related to the market (level of competition; number of companies producing and receiving services) the balance of demand-supply, domestic or international transportation, related regulations with other countries, warehouse costs, customs and port fees, packaging costs, and communication costs are order management, invoices, costs for information systems, and handling costs.

The overall of transportation costs related on fourth categorycal are capital cost, operational cost, voyage cost, and cargo handling cost. The explanantions of the transportation port cost are: Capital Cost are the shpping price when it was bought or built. Capital costs are included in the calculation cost of the loan interest payments and return on capital depending on how the vessel is procured. This return on capital cost as an annual payment.

Based on mainly two things are First is how the ship is financed. If financed by loan, then it will depend on Size of loan, source of loan, Interest rate, and Terms of loan. Second capital cost is Depreciation- Deprecation Cost are refers to two very different but related concepts. First is decline

in value of assets and Second is allocation of the cost of tangible assets to periods in which the assets are used. Depreciation cost depends on Cost of asset, Expected salvage value of asset, Estimated useful life of asset, A method of apportioning the cost over such life.

The cost of Operating are fixed costs incurred for daily operational aspects to keep the ship ready to sail. Operating costs consist of maintenance and repair costs, salary for employees, supplies, lubricating oil, insurance and administration.The overall objective is to reduce operating costs and total travel times while satisfying a set of constraints to ensure a high level of operational.

The cost of Voyage are basically comprises of following: (1) fuel prices or fuel costs - that depends on fuel prices, engine power and efficiency applied to ship operations. Missing breaks to cool the engine, lost as exhaust gas emissions, lost on propeller & Hull friction, Hull and Ship speed design and state. (2) The cost of using the port: - consists of costs for the use of facilities and services provided by the port. a) Port fees - General use of port facilities. It depends on cargo volume, cargo weight, Gross Tonnage, Net Tonnage. b) Service fees include: Pilotage, Towage, Cargo handling. (3) Channel Charges. The role of port transportation in optimizing the costs incurred in vessel operations basically plays an important role in reducing operating costs by maintaining the efficiency and maintenance of all equipment so that there is no loss of trading time. It can also optimize travel costs of transportations port.

2.3 Gravity Model

The concept of Gravity Model is a model used to analyze economic factors that affect trade between two countries. The gravity model is a conceptual model that gives a deeper explanation when there is trade between countries (bilateral, regional and multinational).This model that was formed based on Newton's law of gravity was applied to analyze the occurrence of trade flows between countries (Deadorff, 1995). Anderson, (1979: 2016) defines the theory of gravity as a theory that describes the level of spatial interaction between two or more entities that have physical symptoms. Newton's gravitational law can be written as follows:

$$G_{ij} = a_{ij} m_i m_j d_{ij}^{-2} \qquad (1.1)$$

Where G_ij is the force of gravity, a_ij is konstansta, m_i and m_j are respectively mass forces at places i and j while d_ij ^ (- 2) is the distance between place i and j.

$$\sum_i T_{ij} = P_i k(P_j/P) \qquad (1.2)$$

From equation (1.), a basic formula can be determined to calculate the number of trips (trip) between the area of origin i and destination area j.

$$T_{ij} = k[(P_i/P_j)/P] \quad 1.3)$$

When $G = k/PG$ is a constant, the general formula of the Gravity Model is obtained as follows:

$$T_{ij} = G\left[(P_i P_j)\right]/d_{ij}^{b} \quad (1.4)$$

The distance between the area of origin and destination will affect the number of trips that can be made. The farther the distance traveled, the smaller the number of trips because it requires a greater transport cost. Conversely, if the distance between the two regions is relatively close, the amount of transportation costs required will also be small. Then the mathematical equation calculates the element of distance between the area of origin and destination.

3. Methodology

This study used the gravity model, and the data analyzes is an determinants of regional trade. Data of analysis using 4 years (years of 2014-2018). The analyses to examine the determinants of Indonesia's trade by regional country member. The framework with the estimations of trading performance of Indonesia. Analysis runing data used Eviews10. Analysis statistics to tests applied for panel data, while simply averages data of the cross-sectional and time series test statistics descriptive.

In the measurement is the weighted average of the country scores covering 4 years ease of arranging competitively cost transportasion dan efficiency of handling cost. The quality of logistics performance can be gauged from the World Bank data, logistic performance index and Indonesian port Associate to give a modest indication of transportation performance across-countries of ASEAN at different levels of development.

4. Empirical Results

This article aims to empirically examine the effect of logistics costs (transportation and handling) on Indonesia's regional trade with ASEAN trade partner countries. Presentation of the results of the analysis using descriptive analysis. where the analytical framework in this study uses logistical data from six countries, collected for 2014, 2016 and 2018. From the results of the investigation shows that logistical costs affect the price of exported commodities and imports. Based on the results of the export and import equation, it can be seen that the specific dimensions related to logistics performance directly affect the activities of trade in each country. The result of investigation had two reviews the logistic performance index

of Indonesia and ASEAN Country analytical framework. Logistics performance indext ranking of ASEAN area can be categorized into five parts, as shown in Table 2.

Table 2. Dimension of Regional Trade Countries in the Logistics Performance Index:

Country	Overall		Customs		Infrastructure		International Shipment		Logistics Quality And Competence		Tracking and Tracing		Timeliness	
	Rank	score	Rank	Score	Rank	score	Rank	score	Rank	score	Rank	score	Rank	score
Singapura	1	5	1	3	2	2	2	6	6	8	6	11	1	9
Malaysia	25	25	29	27	27	26	26	10	30	32	28	17	28	25
Thailand	35	35	42	36	44	30	35	39	49	38	45	33	39	29
Vietnam	53	48	63	61	72	44	39	42	82	49	47	48	38	56
Indonesia	59	53	75	55	85	56	57	74	62	41	52	58	42	50
Filipina	52	57	67	47	62	75	56	35	39	61	39	64	69	50
Kamboja	101	83	108	71	128	79	101	78	103	89	78	71	104	129
Laos	109	131	93	100	106	128	123	120	104	129	111	146	118	137
Myanmar	129	145	122	150	133	137	116	151	110	156	129	130	140	117

Sumber: http://lpisurvey.worldbank.org/ (2019)

The performance of increasing regional trade aims to improve the trading system from a logistical aspect. However, differences in transportation costs and handling constraints in fulfilling the desire of many countries to accelerate the pace of integration in the global trading system will improve the quality and efficiency of supporting structures such as logistics services. Poor logistics services such as limited coordination between countries regarding border procedures; inefficiency of the customs process at the port; fragmented and poor quality transportation infrastructure; expensive and rare shipments (with long and indirect shipping routes); delay tracking and tracking shipments; late handling of the terminal and cleaning of goods; absence of cold storage facilities at the port; and inability to certify product quality; among others; can cause a significant impact on international trade.

The regional trading and the desire by many countries to speed up the pace of integration within the global trading system will depend not only on maintaining an open global economic system but improving the quantity and efficiency of the support structures such as the logistics services.

Data limitations have made research on logistics strong. The recent initiative by the World Bank in compiling the Logistics Performance Index (LPI) for several countries around the world has made it possible to gain a reasonable understanding of achievements in the field of logistics at the national level for several countries in the world. In the table 2, show are comparing of the ranking and score of Indonesia to other lower-middle

income economies in Asia, then there is no room for complacency. Indonesia still ranks below Malaysia, Thailand, Singapore, Philippina, Kamboja, Laos, Myanmar and Vietnam (in fact Vietnam overtook Indonesia in the latest LPI). The issues related to weak connectivity cause relatively high logistical costs, implying that Indonesian products and services are not competitive compared to their regional partners.

The logistics cost of all activities are collected and computed accordingly on Figure 1:

Figure 1. Logistic Performance of Indonesia

Resource: Bisnis.com (2019)

Overall logistic performance index, reliability of quality logistic competency, times and costs delivery, are the main variavel is influencing mode choice in the logitic performance of transport sector. Rliability of delivery times, container cost and delivery cycles which are delay free.The Logistic Performance Index (LPI) 2018, Indonesia postioning 3.15 points at 46st position or increased on LPI 2017 skor 2,98 points at 63st position. But its less from Thailand (peringkat 32), Vietnam (39), dan Malaysia (41), couses of logistic cost is than highly from the other country. Indonesia Logistic cost has 23,5% by 2017,or more less than of Asean country such as Vietnam (15%), Thailand (13,2%), Malaysia (13%) dan Singapura (8,1%) (Zaldy Ilham Masita, 2018).

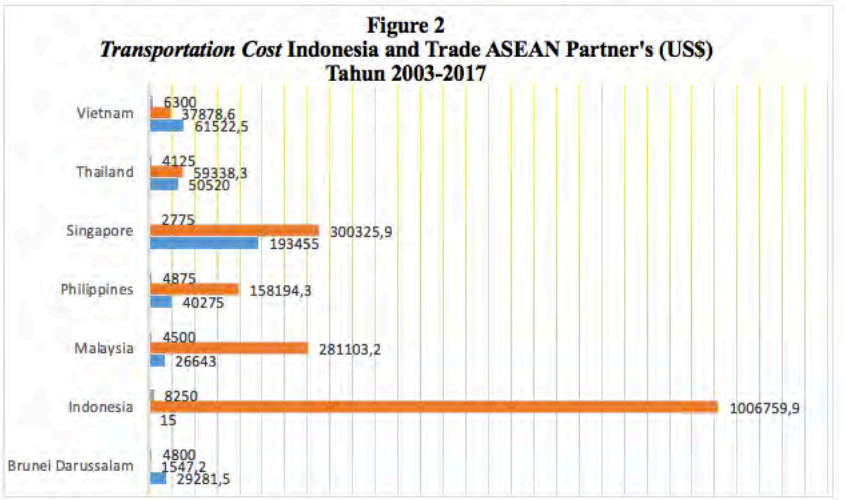
The recent research result are directly applicable to logistic peformance index of Indonesia had investigated for regional trading impact, its have higher logistics (transportation coat). Where as the logistics cost is highest. The value of loss during delivery account for the main proportion of these transportation costs. Using the same data as in the gravity model, we apply the panel model developed to estimate the efficiency component based on the model error of the gravity model through a production function, by maximizing the cost tranportatioan from a number of Logistic Index performance. Efficeiency scores and rankings are shown in the table and figure below. The dashed line in the figure is the graphical representation of the cost transportation of ASEAN members regional trading partner of Indonesian.

Table 2. Indonesia's Performance in the Transportation Indicator

Indicator	2014	2016	2018
Customs	55	69	62
Infrastructure	56	73	54
International Shipments	74	71	42
Logistics Competence	41	55	44
Tracking & Tracing	58	51	39
Timeliness	50	61	41

Source: World Bank (2019)

Indonesia's position in the Logistics Performance Index (LPI) shows that Indonesia is at level 17 of 160 countries. there has been an increase in levels in two years, ranking 160 countries. LPI is the world logistics performance index released by the World Bank every two years since 2014, which measures the logistics performance of trade in a country. In the 2018 edition of the report released on Tuesday, the bank analyzed countries based on six indicators, namely customs efficiency and border management permits, trade quality and transportation-related infrastructure, ease of regulating international shipping with competitive prices, competency and quality of logistics services, capability to track and track shipments, and the frequency of shipments in time according to shipping scheduling. Timeliness; the timeliness of shipments in reaching destination within the scheduled or expected delivery time



Source: Primary Data Analysis (2019)

The figure 2, above shows that the transportation costs incurred at the ports of each country are different. National logistics costs in Indonesia are 24 percent of GDP, higher than neighboring countries. The lowest transportation costs apply at Port of Singapore (Singapore) of US $ 185 and also the farthest distance to Indonesia (Tanjung Priok port), which is 12,897.00 miles. Geographical distance is not an obstacle for other countries to use Singapore port as a transit port, because transportation tariffs are more competitive than other ports.

It turns out that the transportation tariff in Tanjung Priok port as a place of direct export-import activities abroad has a tariff that is 7.5 times more expensive than Singapore or US $ 365. The port of Singapore has high competitiveness in regional trade. Because with competitive advantages from the efficiency aspects of transportation costs that are close to Indonesia compared to other countries, making Singapore port as a transit port for exporters or importers of trading partner countries to Indonesia in an effort to save transportation costs rather than directly to Tanjung Priok port in Indonesia.

The anlysis of the efficiency scores estimated by descriptive analysis, this studi result built, using one standard from the average, three classes of efficiency as shown in the previous table 1 and figure 2. The maximum efficiency, which also gives the transportation cost efficiency, is own by Singapore, followed by Thailand, Malaysia, Philipinne, Vietnam and In-

donesia. Indonesia which has the lowest degree of transportation cost effectiveness of all ASEAN countries. For Singapore, the comparative analysis of foreign trade efficiency between ASEAN Member trading partner revealed that it has Indonesia the lowest efficiency score, Singapore while the nearest landmark in terms of integration into the ASEAN, is in a higher category of transportatioon performance.

5. Conclusion

In this study, we have tested a logistic performance index model for Indonesia regional trading using three transportation sector and measures of the efficiency of customes, Infrastructure, International Shipments, Logistics Competence, logistics performance, related to consignments and timeliness of transsportation services. Our results suggest that regional trade openness may impact growth favorably in the long run.

The present logitic performance and cost handling problem has several applications. It is an efficient tool for many real regional trading problems for increasing the transportation cost of Indonesia trading. In addition, Indonesian have the lowest logistics performance index and hight cost tranportation. This implies that the transportation cost is very hights and eficiency on the regional trading is Singapore. Where as the effect of export volume less, so that the average transportation cost of regional trade.

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