The Effect Of Freight And Passenger Services On Transport And Its Implication On Indonesia's Services Trade Balance

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Abstract

In several recent years, Indonesia's services trade balance which is reported by Bank Indonesia was shown negative figures. Transport has greatly contributed to Indonesia's services trade balance deficit. Transport consist of freight, passanger services and other. The negative figures of transport mainly caused by freight. According to this phenomenon, this research tries to analyze the effect of freight and passenger services on transport and its implication on Indonesia's services trade balance. This research based on quarterly data from 1st quarter 2005 to 3rd quarter 2018. Data analysis and hypotheses testing using EViews 10. This study will prove which variables have the most influence on Indonesia's service trade balance

Keywords: *Freight, passenger services, transport, services trade balance*

Abstrak

Penelitian Dalam beberapa tahun terakhir, neraca perdagangan jasa Indonesia yang dilaporkan oleh Bank Indonesia menunjukkan angka negatif. Transportasi telah memberikan kontribusi yang besar terhadap defisit neraca perdagangan jasa Indonesia. Angkutan terdiri dari angkutan barang, jasa penumpang dan lain-lain. Angka negatif transportasi terutama disebabkan oleh pengiriman barang. Berdasarkan fenomena tersebut, penelitian ini mencoba menganalisis pengaruh jasa angkutan barang dan penumpang terhadap transportasi dan implikasinya terhadap neraca perdagangan jasa Indonesia. Penelitian ini berdasarkan data triwulanan dari triwulan I 2005 sampai triwulan III 2018. Analisis data dan pengujian hipotesis menggunakan EViews 10. Penelitian ini akan membuktikan variabel mana yang paling berpengaruh terhadap neraca perdagangan jasa Indonesia

Kata Kunci: Angkutan barang, jasa penumpang, angkutan, neraca perdagangan jasa

1. Introduction

Indonesia, as a country in the Southeast Asia region, needs to criticize every aspect of the Indonesian economy to accelerate national economic development. Services Trade Balance which is a reflection of net export & import services, is one of the important aspects in the Current Account which is part of Indonesia's Balance of Payments. Positive services trade balance, will contribute to enhance state financial capabilities for national development. Conversely, a negative services trade balance will burden the balance of payments. A very possible effort to reduce or minimize the negative numbers of the trade balance of services is to reduce the negative transport numbers. This study will discuss how far the effect of freight and passenger services on transport and its implication on the services trade balance

Based on Indonesia's Balance of Payment (Summary), there are 3 main account namely Current Account (include: goods, services, primary income and secondary income), Capital Account (receipts and payments) and Financial Account (include direct investment, portfolio investment, financial derivatives, and other investment).

Furthermore Current Account of Goods, consist of general merchandise (include non-oil and gas as well as oil and gas) and other goods. While Current Account of Services include elements namely: Manufacturing services, Maintenance and repair services, Transport, Travel, Construction, Insurance and pension services, Financial services, Charges for the use of intellectual property, Telecommunication, computer and information services, Other Business Services, Personal, Cultural, and recrea-
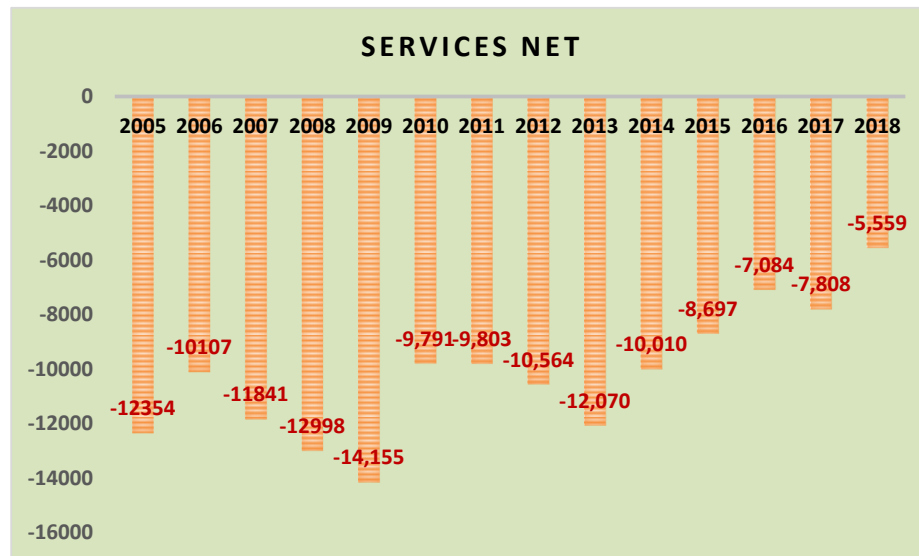
Source: BOP 2005 – 2018

Figure 1. Services Net from 2005 to 2018 (Q3)

tional services, Government goods and services.

The current account of services from 2005 to 2018 (Q3) shows negative figures. In order to overcome the problem of services account deficit, it is necessary to examine the variables that affect it.

The value of services transactions for one year, which is recorded is the value of services exports and services imports, which then calculated the services transaction (net) equal the value of services exports minus services imports.

Transport as a part of services are grouped by type into passenger services, freight and other services.

Freight refer to the transportation of goods and almost always related to the export and import of goods. Goods transportation services also include the cost of loading and unloading goods, from and to the shipping vessel at the port if required in the contract.

Passenger services includes the provision of services related to international transportation for non-residents by domestic airlines (inflow) or for residents by international airlines (outflow). Included in passenger services is the cost of excess baggage, the cost of moving goods that accompany the passenger trip, and expenses for food, drinks, or other shopping while the passenger is on board.

There are many things that can be done to various elements in the components of the net services in order to overcome the problem of service account deficits. Among them are: a) increasing in results that are already positive and b) give priority to activities that provide negative results to be positive or at least reduce the negative number.

Related to this matter, this research will examine the effect of freight and passenger services on transport and its implication on Indonesia's services trade balance.

Literature Review

Freight refer to the transportation of goods and almost always related to the export and import of goods. Goods transportation services also include the cost of loading and unloading goods, from and to the shipping vessel at the port if required in the contract. Freight is generally used as an overarching term that includes all activities related to the movement and coordination of goods from their source of origin to the final point of delivery, and includes production and distribution. Here, movement does not just correspond to physical movement of goods but also the flow of information (Bektas, 2017).

Freight transport is an essential part of our economy as it fulfils a unique service

within supply chains, bridging the distances between spatially separated places of

supply and demand. As is the case with passenger transport, accessibility of places

for freight is vital or the economic development of society. Freight transport flows

have been growing continuously in the past, due to an increase in population, falling trade barriers and declining transport costs. In addition, the growth of freight

flows is propelled by increasing consumption levels and the customisation of products and services. This growth has been facilitated by major infrastructure extensions including roads, railways, waterways, ports and storage and transhipment activities (Tavasszy & Jong, 2014).

National income and expenditure is included in the main macroeconomic scope.

The macroeconomic variables consist of:

• National income level
• Household consumption

- National Investment (government / private)
- Savings rate
- Government expenditure
- Price levels
- Money supply (inflation)
- Interest rate
- Employment Opportunity
- State budget and expenditure budget (APBN)
- Balance of payments (export and import)

(source: https://www.zonareferensi.com/ruang-lingkup-ekonomi-makro)

There are 3 national income calculation methods (https://brainly.co.id) namely:

1. Production Approach
   The Production Approach formula is as follows:

   Y = (P1X Q1) + (P2X Q2) + ... (PnX Qn)

   Y= National Income, P=Price, Q=Quantity.

2. Income Approach
   The Income Approach formula is as follows:

   Y = r + w + i + p

   Y = National Income
   r = Income from wages, salaries, and more
   w = Net income from rent
   i = Interest income
   p = Income from profits of companies and individual businesses

3. Expenditure Approach
   The Expenditure Approach formula is as follows:

   Y = C + I + G + (X – M)

   Y= National income
   C = Consumption (household consumption)
   I = Investment
   G = Government expenditure
   X = Export
   M = import

   Based on the above description, and in line with Keynes's theory for an open economy and according to Mc.Eachern (1997) and Andolfatto (2005: 8) that the national income equation is: Y = C+ I + G + (X – M), this research will examines (X-M), especially in terms of transportation services in international trade.
Indonesia's balance of payments reported by Bank Indonesia states that there are current accounts for goods and services, which are export and import trade figures for goods and services. This study only examines the current account of services, espe-

cially transportation services.
   The realization of (X-M) in the balance of payments (current account), can be described as goods trade balance (GTB) and services trade balance (STB).The definition here is the result of export - import for each element. Thus the formula (X - M) can be written with: (X – M) = GTB + STB.
Variables that possible to be observed in the services trade balance (STB) among others transport (including passenger, freight), insurances and pension services, charges for the use of intellectual property and other business services.
In this study observations were carried out only for variables transport (including its component) which are significantly contributed negative figures in the services trade balance. Therefore this study examine variables freight (FR), passenger (PS), transport (TRS) and services trade balance (SERV).
   Previous research related to transportation in international trade: Kumar and Hoffman (2002) mentioned that shipping has been an important human activity throughout history, particularly where prosperity depended primarily on international and interregional trade. In fact, transportation has been called one of the four cornerstones of globalization, along with the communications, international standardization, and trade liberalization
   Anderson and Wincoop (2004) stated evidence on trade costs comes in policy (tariffs, quotas and the like) and costs imposed by the environment (transportation, insurance against various hazard, time costs).
   Hummels (2007) stated there are three ways to put the economic importance of transportation costs in perspective: by examining 1) transportation costs relative to the value of the goods being moved; 2) transportation costs relative to other known barriers to trade, like tariffs; and 3) the extent to which transportation costs alter relative prices.
Sourdin and Korinek (2009) in their study about maritime transport costs and their impact on trade, with the result provides evidence that maritime transport costs have a strong impact on trade
   According to Ralahalu and Jinca (2013), growth in the transport sector is a barometer of economic growth and development of the region directly, and one of the cornerstones of success of national development. The development of the transport sector Gross Regional Domestic Product (GRDP) is affected by economic conditions and population of an area. GRDP as a driver of economic activity and population movements associated with the needs of passengers and goods, given the conditions and characteristics of the different regions in support of socio-economic activities of the community.
Referring to the above description, this study presents the conceptual framework
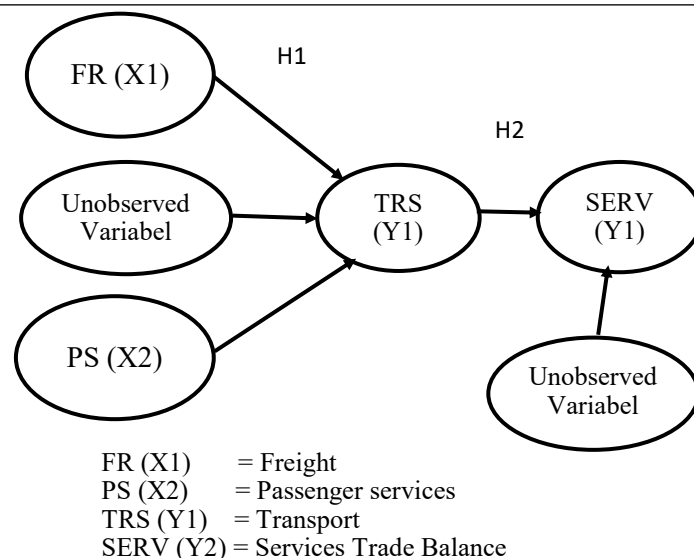
FR (X1)   = Freight
PS (X2)   = Passenger services
TRS (Y1)   = Transport
SERV (Y2) = Services Trade Balance

Figure 2. The Conceptual Framework

Hypothesis
H1 : Freight and passenger services have an effect on transport
H2 : Transport has an effect on services trade balance

3. Research Methodology

This type of research is descriptive quantitative research that aims to determine the relationship between variables and examine through hypothesis testing. Observations use time coverage for 55 quarters (from 1st quarter 2005 to 3rd quarter 2018). Quantitative data comes from Indonesia's Balance of Payments Report issued by Bank Indonesia (Balance of Payment / BOP Quarterly Report from 1st quarter 2005 to 3rd quarter 2018). Data analysis and hypotheses testing using EViews 10 (including unit root test and co-integrating test, linear regression equation,VAR and ECM).

In line with the purpose of this study is to observe factors that influence the transport and the services trade balance, then the research is carried out on variables that are estimated to have significant effect on transportation and services trade balance.

The variables in this study are as follows:

FR (X1)   = Freight
PS (X2)   = Passenger services
TRS (Y1) = Transport
SERV (Y2) = Services Trade Balance

Linear regression equations related to the variables to be analyzed (in line with hypotheses) are as follows:

$$Y_1 = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \varepsilon$$
$$Y_2 = \beta_0 + \beta Y_1 + \varepsilon$$

The unobserved variables related to transport and services trade balance, may be can be used as reference for the next study.

4. Discussion
Data analysis

The data to be analyzed is data from variables: freight (FR), passenger services (PS), transport (TRS), and services trade balance (SERV) from 1st quarter 2005 to 3rd quarter of 2018. As shown on figure 3, the negative numbers reflected the deficit.
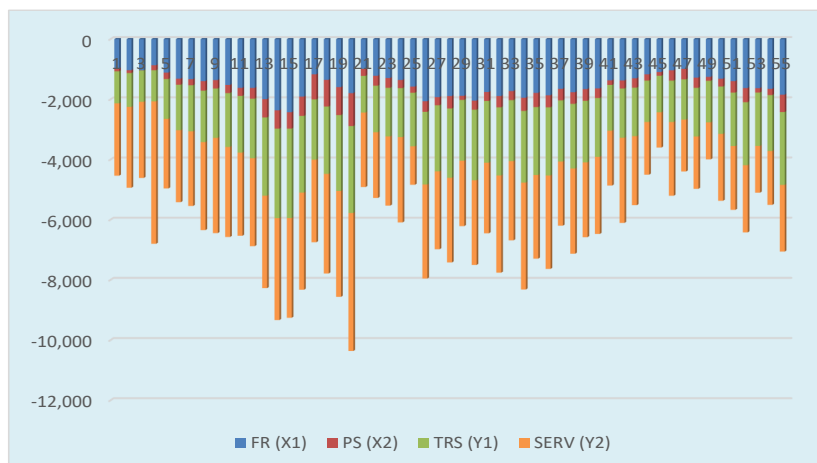

Figure 3. Quarterly data from 2005 - 2018

Unit Root Test

Unit root test (Augmented Dickey-Fuller test statistic) is used to test stationary data.

Null Hypothesis: Y2 has a unit root
Exogenous: Constant
Lag Length: 3 (Automatic - based on SIC, maxlag=10)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.180610	0.6760
Test critical values: 1% level	-3.565430	
5% level	-2.919952	
10% level	-2.597905	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(Y2)
Method: Least Squares
Date: 03/06/19 Time: 16:45
Sample (adjusted): 2006Q1 2018Q3
Included observations: 51 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Y2(-1)	-0.178730	0.151388	-1.180610	0.2438
D(Y2(-1))	-0.620735	0.160736	-3.861822	0.0004
D(Y2(-2))	-0.465345	0.157331	-2.957753	0.0049
D(Y2(-3))	-0.515601	0.121932	-4.228610	0.0001
C	1.373975	1.186954	1.157564	0.2530

Figure 4. root test using ADF

The result of unit root test using ADF test, each variable as follows:

a. Freight (X1), prob. > 0.05 means the data is not stationary.
b. Passenger services (X2), prob < 0.05 means the data is stationary.
c. Transport (Y1), prob < 0.05 means the data is stationary
d. Services trade balance (Y2), prob. > 0.05 means the data is not stationary.

Due to some data stationary and not stationary, then statistical tests using VAR and ECM. The steps as follows:

1. VAR Stability Condition Check
2. Optimum Lag Test
3. Cointegration Test
4. Vector Error Correction Model

VAR Stability Condition Check

The calculation results in checking on a stable VAR condition can be seen in the following pigure 5.

Roots of Characteristic Polynomial
Endogenous variables: D(X1) D(X2) D(Y1) D(Y2)
Exogenous variables: C
Lag specification: 1 7
Date: 03/06/19 Time: 18:46

Root	Modulus
0.073845 + 0.988780i	0.991533
0.073845 - 0.988780i	0.991533
-0.962889	0.962889
-0.521057 - 0.779859i	0.937913
-0.521057 + 0.779859i	0.937913
0.845306 + 0.389464i	0.930712
0.845306 - 0.389464i	0.930712
-0.816391 - 0.420232i	0.918199
-0.816391 + 0.420232i	0.918199
-0.165720 + 0.873589i	0.889169
-0.165720 - 0.873589i	0.889169
0.447625 + 0.746879i	0.870744
0.447625 - 0.746879i	0.870744
-0.613002 - 0.492953i	0.786622
-0.613002 + 0.492953i	0.786622
0.146767 + 0.763605i	0.777582
0.146767 - 0.763605i	0.777582
0.473057 - 0.573028i	0.743063
0.473057 + 0.573028i	0.743063
0.736106	0.736106
-0.704585 + 0.163892i	0.723395
-0.704585 - 0.163892i	0.723395
0.601633 - 0.372014i	0.707359
0.601633 + 0.372014i	0.707359
0.106716 + 0.579732i	0.589472
0.106716 - 0.579732i	0.589472
-0.400641	0.400641
0.032240	0.032240

No root lies outside the unit circle.
VAR satisfies the stability condition.

Figure 5. root test using ADF

The stability condition (of VAR Model) at lag 1 - 7.

Based on the above result, t statistics > 1,96 (at level α = 5%) means variables X1 and X2 have an effect on Y1. The other words freight and passenger services have an effect on Transport. In more detail, the effect of freight on transport is greater than the effect of passenger service on transport, which is reflected in the coefficient of 0.782 X1 (freight) and 0.228 X2 (passenger service).

Vector Error Correction Model

The calculation results in checking on a stable Vector Error Correction can be seen in the following pigure 6.

```
Vector Error Correction Estimates
Date: 03/06/19   Time: 20:37
Sample (adjusted): 2005Q4 2018Q3
Included observations: 52 after adjustments
Standard errors in ( ) & t-statistics in [ ]
```

Cointegrating Eq:	CointEq1
Y1(-1)	1.000000
X1(-1)	-0.782410
	(0.02385)
	[-32.8058]
X2(-1)	-0.228579
	(0.00860)
	[-26.5862]
C	-0.493361

Figure 6. Vector Error Correction

Based on the above result, t statistics > 1,96 (at level α = 5%) means variables X1 and X2 have an effect on Y1. The other words freight and passenger services have an effect on Transport. In more detail, the effect of freight on transport is greater than the effect of passenger service on transport, which is reflected in the coefficient of 0.782 X1 (freight) and 0.228 X2 (passenger service).

Cointegration Test (Y2, Y1)

The calculation results in checking on a stable Cointegration Test can be seen in the following pigure 7.

```
Date: 03/06/19   Time: 20:23
Sample (adjusted): 2005Q4 2018Q3
Included observations: 52 after adjustments
Trend assumption: Linear deterministic trend (restricted)
Series: Y2 Y1
Lags interval (in first differences): 1 to 2
```

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.437542	37.70552	25.87211	0.0011
At most 1	0.139006	7.782699	12.51798	0.2699

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Figure 7. Cointegration Test

Based on the above result, t statistics > 1,96 (at level α = 5%) means variables Y1 (transport) have an effect on Y2 (services trade balance). CointEq shows that transport have an significant effect on Services Trade Balance.

Finding

Freight from year to year shows a significant negative number, this is mainly due to shipments of exports and imports dominated by foreign vessels. Not only imports of goods from abroad to Indonesia are transported by foreign vessels but the export of goods from Indonesia abroad is also mostly carried by foreign vessels. For example, coal exports, the practice of coal export transactions commonly use the FOB (free on board) scheme where exporters are obliged to deliver coal on board, prepare export licenses, pay taxes and royalties that apply and others. On the other hand, importers must take care of transport vessels, contract transportation, pay freight costs and cover insurance costs. So far, with main export destination countries such as China, India, Japan, South Korea and Taiwan generally FOB. The ship is determined by the buyer.

In fact, the problem of the use of foreign vessels in export activities is not only in term of the FOB (free on board) scheme, but also from the shipping industry side that the availability of domestic vessels with large size carrying export cargo is still very limited. In addition, the seaworthiness of ships that are internationally recognized is needed for international shipping.

Conclusion & Recommendation

Conclusion

The results of hypothesis testing show that freight and passenger services have an effect on transport. While transport has significant effect on services trade balance.

Recommendation

If Indonesia wants to reduce the services trade balance deficit, one alternative that can be taken is reducing negative figures of transport, through increasing the role of national vessels in carrying export/import goods. This will be an interesting topic for further research.

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