Sector and Country Balance of Trade Analysis Based on World Input-Output Database: Indonesian Economy

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Abstract

This paper analyses trade balance in the Indonesian economy by using Indonesia input-output tables for the year 2000, 2005, 2010 and 2014. The results showed that, firstly, Indonesian export had been increased significantly during the year of study. Secondly, Indonesian import had also increased significantly during the year of study. Important sectors and countries' trade partners of export and import had been indicated. Thirdly, trade balances in Indonesia economy were surpluses in all years of the study. Sectors and countries in which trade balances were deficits and surpluses had also been clearly indicated.

Keywords*: export, import, trade balance*

Abstrak

Makalah ini menganalisis neraca perdagangan dalam perekonomian Indonesia dengan menggunakan tabel input-output Indonesia untuk tahun 2000, 2005, 2010 dan 2014. Hasilnya menunjukkan bahwa, pertama, ekspor Indonesia telah meningkat secara signifikan selama tahun penelitian. Kedua, impor Indonesia juga meningkat secara signifikan selama tahun penelitian. Sektor-sektor penting dan mitra perdagangan ekspor dan impor negara telah diindikasikan. Ketiga, neraca perdagangan dalam perekonomian Indonesia merupakan surplus dalam semua tahun penelitian. Sektor-sektor dan negara-negara di mana neraca perdagangan mengalami defisit dan surplus juga telah ditunjukkan dengan jelas.

Kata kunci : ekspor, impor, neraca perdagangan

INTRODUCTION

The trade balance is the important element in Balance of Payment, which is the record of all economic transactions between the residents of the country and of the world in a particular period (Levi, 2009). The balance of trade is the difference between the monetary value of a nation's exports and imports over a certain period (O'Sullivanand Sheffrin, 2003). If a country exports greater than it imports, it has a trade surplus. If a country imports greater than it exports, it has a trade deficit.

Exports are the goods and services produced in one country and purchased

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by citizens of another country. It doesn't matter what the good or service is. It doesn't matter how it is sent. It can be shipped, sent by email, or carried in personal luggage on a plane. Whether it is produced domestically or it is sold to someone from a foreign country, it is an export. The term export means sending goods or services produced in one country to another country. The seller of such goods and services is referred to as an exporter; the foreign buyer is referred to as an importer (Joshi, 2005; 2009). Most countries want to increase their exports. Their companies want to sell more. If they have sold all they can their own country's population, then they want to sell overseas as well. The more they export, the greater they get competitive advantages. That's because they gain expertise in producing goods and services. They also gain knowledge about how to sell to foreign markets.

Imports consist of transactions in goods and services to a resident of a jurisdiction such as a nation from non-residents (Lequiller and Blades, 2006). An import of a good occurs when there is a change of ownership from a non-resident to a resident. Imports of services consist of all services rendered by non-residents to residents. In national accounts, import includes and excludes specific "borderline" cases. In macroeconomic theory, the value of imports can be modeled as a function of the domestic absorption and the real exchange rate Burda (2005). There are two basic types of import: industrial and consumer goods and intermediate goods and services. Companies import goods and services to supply to the domestic

market at a lower price and better quality than competing goods manufactured in the domestic market.

One of the objectives of developing World Input-Output Database (WIOD) is to analyze the effects of globalization on trade patterns, environmental pressures and socio-economic development across a wide set of countries (Timmer, et al., 2012). WIOD 2016 release covers all trade between forty-three countries as well as with a "rest-of-the-world" region (Timmer et al., 2016). Basically, a world input-output table (WIOT) is an extension of the national input-output table. The difference with the national tables is that the use of products is broken down according to their origin and destination. For a country, flows of products both for intermediate and final use are split into domestically produced or imported. Output produced by a country is either consumed domestically or exported (Miller and Blair, 1985).

Indonesia is the largest economy in Southeast Asia and is one of the emerging market economies of the world. The country is also a member of G-20 major economies and classified as a newly industrialized country (Worldbank, 2017). It is the sixteenth largest economy in the world by nominal GDP and is the seventh largest in terms of GDP (PPP). Its GDP per capita, however, ranks below the world average. Indonesia still depends on domestic market, and government budget spending and its ownership of state-owned enterprises and the administration of prices of a range of basic goods including, rice, and electricity plays a significant role in

Indonesia market economy, but since the 1990s, the majority of the economy has been controlled by private Indonesians and foreign companies (Adhi, 2015).

The objective of this paper is to analyze trade balance in Indonesian economy usingIndonesiaworld input-output tables of years 2000, 2005, 2010 and 2014 derived from WIOT 2016.

LITERATURE REVIEW

The trade balance, also known as the balance of trade (BOT), is the calculation of a country's exports minus its imports. When a country imports more than it exports, the resulting negative number is called a trade deficit. When the opposite is true, a country has a trade surplus. The balance of trade is the difference between the monetary value of a nation's exports and imports over a certain period (O'Sullivan and Sheffrin, 2003; Levi, 2009). Sometimes a distinction is made between a balance of trade for goods versus one for services. The balance of trade forms part of the current account, which includes other transactions such as income from the net international investment position as well as international aid. If the current account is in surplus, the country's net international asset position increases correspondingly. Equally, a deficit decreases the net international asset position.

Exports are the goods and services produced in one country and purchased by citizens of another country. It doesn't matter what the good or service is. It doesn't matter how it is sent. It can be shipped, sent by email, or carried in personal luggage on a plane. Whether it is produced domestically or it is sold to someone from a foreign country, it is an export. The term export means sending goods or services produced in one country to another country. The seller of such goods and services is referred to as an exporter; the foreign buyer is referred to as an importer (Joshi, 2005; 2009). Most countries want to increase their exports. Their companies want to sell more. If they have sold all they can their own country's population, then they want to sell overseas as well. The more they export, the greater they get competitive advantages. That's because they gain expertise in producing goods and services. They also gain knowledge about how to sell to foreign markets.

Governments encourage exports. That's because it will increase job opportunities, bring higher wages and raise the standard of living for the people. They become happier and more likely to support their national leaders. Exports also increase the foreign exchange reserves held in the nation's central bank. That's because foreigners pay for exports either in their own currency or the U.S. dollar. A country with large reserves can use it to manage their own currency's value. They have enough foreign currency to flood the market with their own currency. That lower the cost of their exports in other countries. Countries also use currency reserves to manage liquidity. That means they can be better to control inflation, which is too much money chasing too few goods. That decreases the money supply, making the local currency worth more (Hill, 2015).

Exporting has two distinct

advantages. First, it avoids the often-substantial cost of establishing manufacturing operations in the host country (Hill, 2015). Second, exporting may help a company achieve experience curve effects and location economies (Hill, 2015). Exporting has a number of drawbacks. Firstly, exporting from the firm's home base may not be appropriate if lower-cost locations for manufacturing the product can be found abroad. It may be preferable to manufacture where conditions are most favorable to value creation and to export to the rest of the world from that location (Hill, 2015). A second drawback to exporting is that high transport cost can make exporting uneconomical, particularly for bulk products. One way to fix this is to manufacture bulk products regionally (Hill, 2015). Another drawback is that high tariff barriers can make exporting uneconomical and very risky (Hill, 2015). For small and medium enterprises (SMEs) with fewer than 250 employees, selling goods and services to foreign markets can be more difficult than serving the domestic market. The lack of knowledge of trade regulations, cultural differences, different languages, and foreign-exchange situations, as well as the strain of resources and staff, interact like a block for exporting. Indeed, there are some SMEs which are exporting, but nearly two-thirds of them sell to only one foreign market (Daniel, et al., 2007). Motivational factors are "all those factors triggering the decision of the firm to initiate and develop export activities". In the literature, export barriers are divided into four large categories: motivational, informational,

operational/ resource-based, and special knowledge (Seringhouse, 1990). In addition, export motivators are divided into five dimensions; reaction, marketing, export, technology, external (Stouraitis, et al., 2017). Research shows that exporters are more favorable to motivators than non-exporters (Leonidou, et al., 2007).

An import is a good brought into a jurisdiction, especially across a national border, from an external source. The party bringing in the good is called an importer (Joshi, 2009). An import in the receiving country is an export from the sending country. Importation and exportation are the defining financial transactions of international trade. In international trade, the importation and exportation of goods are limited by import quotas and mandates from the customs authority. Imports consist of transactions in goods and services to a resident of a jurisdiction such as a nation from non-residents (Lequiller and Blades, 2006). An import of a good occurs when there is a change of ownership from a non-resident to a resident. Imports of services consist of all services rendered by non-residents to residents. In national accounts, import includes and excludes specific "borderline" cases. In macroeconomic theory, the value of imports can be modeled as a function of the domestic absorption and the real exchange rate (Burda, 2005). There are two basic types of import: industrial and consumer goods and intermediate goods and services. Companies import goods and services to supply to the domestic market at a lower price and better

quality than competing goods manufactured in the domestic market. Trinh et al (2008) explained that imported intermediate input was shown in the usual Keynesian foreign trade multiplier analysis.

METHOD

An input-output table records the "flows of products from each industrial sector considered as a producer to each of the sectors considered as consumers" (Miller & Blair, 1985). It is an "excellent descriptive device" and a powerful analytical technique (Jensen et.al., 1979). In the production process, each of these industries uses products that were produced by other industries and produces outputs that will be consumed by final users (for private consumption, government consumption, investment and exports) and also by other industries, as inputs for intermediate consumption (Oosterhaven & Stelder, 2007; Timmer et al. (2015).

The columns of the input composition are the total supply of each product *j* (X_j); this is comprised by the national production and also by imported products. The value of a domestic product consists of intermediate consumption of several industrial inputs *I* plus value added. The interindustry transactions table is a nuclear part of this table, in the sense that it provides a detailed portrait of how the different economic activities are interrelated. Since intermediate consumption is of the total-flow type, this implies that true technological relationships are being considered. In fact, each column of the intermediate

consumption table describes the total amount of each input *i* consumed in the production of output *j*, regardless of the geographical origin of that input.

The input-output interconnections can be translated analytically into accounting identities. On the demand perspective, if Z_{ij} denotes the intermediate use of product *i* by industry *j* and y_i denote the final use of product *i*, we may write, to each of the *n* products:

$X_i = Z_{i1} + Z_{i2} + ... + Z_{ii} + ... + Z_{in} + y_i$ (1)

On the supply side, we know that:

$X_j = Z_{1j} + Z_{2j} + ...+ Z_{ji}+... + Z_{nj} + w_j + m_j$ (2)

in which w_j stands for value added in the production of *j* and m_j for total imports of product *j*. It is required that, for *i = j*, $x_i = x_j$, i.e., for one specific product, the total output obtained in the use or demand perspective must equal the total output achieved by the supply perspective. These two equations can be easily related to the National Accounts' identities. In general term, equation (1) can be written as:

$x = Ax + y$ or $x = (I - A)^{-1}y$ (3)

National Input-Output Table of Indonesia for the year 2000, 2005, 2010 and 2014 are available from World Input-Output Data Base (Timmeret al, 2016; 2015). Calculation on total input, output exported to other countries, imported input from other countries, and multipliers were based on the 30 sectors classification of China National Tables.

Import is calculated as summation of input come from other-countries andexport is calculated as summation of output demanded by other-countries. Sector classifications and country abbreviations are available in Appendix 1 and Appendix 2.

RESULT AND DISCUSSION

Indonesian Export

Table 1 provides information on Indonesia export to other countries for the year of 2000, 2005, 2010 and 2014.In the year of 2000, total Indonesia export was 45,523 million US$. The sector with highest percentage of export was Sector-4 (21.44%), followed by Sector-10 (15.21%). The sector with the lowest percentage of export was Sector-23, Sector-24, and Sector-25 (0.00% each). Several other sectors with significant contribution to Indonesian import were: Sector-7 (8.44%), Sector-8 (6.27%), Sector-11 (6.14%), Sector-6 (4.76%), Sector-13 (4.89%), Sector-5 (4.82%), Sector-17 (4.44%), and Sector-15 (3.70%).

In the year of 2005, total Indonesian export was US$ 71,829 million; increased more than one and a half times of that in the year of 2000. The sector with highest percentage of export was Sector-4 (28.17%). The sector with the lowest percentage of export was Sector-9, Sector-23, Sector-24 and Sector-25 (0.00% each). Several other sectors with significant contribution to Indonesian import were: Sector-10 (12.20%), Sector-5 (7.87%), Sector-13

(5.73%), Sector-11 (5.52%), Sector-15 (5.14%), Sector-7 (4.36%), Sector-8 (4.06%), Sector-27 (4.04%), Sector-6 (3.73%), and Sector-17 (3.32%).

In the year of 2010, total Indonesian export was US$ 139,400 million; increased more than twice of that in the year of 2005. The sector with highest percentage of export was Sector-4 (31.68%). The sector with the lowest percentage of export was Sector-23 (0.00%) and Sector-9 (0.00%). Several other sectors with significant contribution to Indonesian export were: Sector-5 (12.32%), Sector-10 (8.43%), Sector-13 (7.17%), Sector-15 (7.13%), and Sector-8 (3.92%).

In the year of 2014, total Indonesian export was US$ 155,263 million; increased a little bit of that in the year of 2010. The sector with highest percentage of export was Sector-4 (29.40%). The sector with the lowest percentage of export was Sector-23 (0.0%). Several other sectors with significant contribution to Indonesian export were: Sector-5 (15.53%), Sector-13 (7.98%), Sector-10 (7.05%), Sector-11 (7.04%), Sector-15 (5.98 %), Sector-8 (3.63%), and Sector-17 (3.12%).

Table 1: Export by Sector in Indonesian Economy: 2000, 2005, 2010, and 2014.

Sector	2000		2005		2010		2014	
	US $ (million)	%	US $ (million)	%	US $ (million)	%	US $ (million)	%
S-1	569	1.25	1,244	1.73	2,800	2.01	2,053	1.32
S-2	76	0.17	249	0.35	91	0.07	137	0.09
S-3	130	0.28	180	0.25	455	0.33	574	0.37
S-4	9,761	21.44	20,233	28.17	44,160	31.68	45,640	29.40
S-5	2,194	4.82	5,655	7.87	17,169	12.32	24,120	15.53

S-6	2,621	5.76	2,680	3.73	3,523	2.53	4,852	3.12
S-7	3,843	8.44	3,132	4.36	3,047	2.19	4,483	2.89
S-8	2,855	6.27	2,916	4.06	5,468	3.92	5,631	3.63
S-9	3	0.01	4	0.00	6	0.00	19	0.01
S-10	6,926	15.21	8,763	12.20	11,753	8.43	10,951	7.05
S-11	2,796	6.14	3,967	5.52	7,230	5.19	10,925	7.04
S-12	118	0.26	226	0.32	723	0.52	1,019	0.66
S-13	2,227	4.89	4,119	5.73	9,988	7.17	12,384	7.98
S-14	666	1.46	769	1.07	844	0.61	821	0.53
S-15	1,686	3.70	3,695	5.14	9,934	7.13	9,286	5.98
S-16	604	1.33	1,130	1.57	1,085	0.78	1,805	1.16
S-17	2,021	4.44	2,384	3.32	3,507	2.52	3,152	2.03
S-18	848	1.86	1,327	1.85	2,458	1.76	3,120	2.01
S-19	1,099	2.41	1,471	2.05	857	0.61	1,216	0.78
S-20	392	0.86	1,005	1.40	1,812	1.30	2,698	1.74
S-21	181	0.40	548	0.76	1,091	0.78	886	0.57
S-22	213	0.47	320	0.45	500	0.36	1,094	0.70
S-23	0	0.00	0	0.00	0	0.00	0	0.00
S-24	0	0.00	0	0.00	8	0.01	9	0.01
S-25	0	0.00	0	0.00	424	0.30	277	0.18
S-26	1,264	2.78	1,200	1.67	2,895	2.08	2,324	1.50
S-27	977	2.15	2,904	4.04	3,775	2.71	2,847	1.83
S-28	1,021	2.24	1,389	1.93	3,082	2.21	2,365	1.52
S-29	51	0.11	236	0.33	288	0.21	208	0.13
S-30	385	0.84	80	0.11	429	0.31	366	0.24
Total	45,523	100.00	71,829	100.00	139,400	100.00	155,263	100.00

Source: Calculated from WIOT, result.

During the year of study, increasing trend in Indonesian export occurred in Sector-4 (21.44% in 2000, 28.17% in 2005, 31.68% in 2010 and 29.40% in 2014), Sector-5 (4.82% in 2000, 7.87% in 2005, 12.32% in 2010 and 15.53% in 2014), Sector-13 (4.89% in 2000, 5.73% in 2005, 7.17% in 2010 and 7.89% in 2014), and Sector-15 (3.7% in 2000, 5.14% in 2005, 7.13% in 2010 and 5.98% in 2014). Decreasing trend in Indonesian export experienced by Sector-6 (5.7% in 2000, 3.73% in 2005, 2.53% in 2010 and 3.12% in 2014), Sector-7 (8.44% in 2000, 4.36% in 2005, 2.19% in 2010 and 2.89% in 2014), Sector-8 (6.27% in 2000, 4.06% in 2005, 3.29% in 2010, and 3.63% in 2014), Sector-10 (15.21% in 2000, 12.20% in 2005, 8.43% in 2010 and 7.05% in 2014), and Sector-17 (4.44% in 2000, 3.32% in 2005, 2.52% in 2010 and 2.03% in 2014).

Table 2 provides information on destination countries of Indonesian export for the year of 2000, 2005, 2010 and 2014. In the year of 2000, if export to the Rest of the World is excluded in analysis, the highest percentages of Indonesian export were to Japan (23.66%) and Korea (10.48%). Several other countries of destination that had imported significant Indonesian goods and services in the year of 2000 were: the USA (7.40%), China (6.57%), Taiwan (3.73%) and Australia (3.47%).

Table 2: Export by Country of Destination in Indonesian Economy: 2000, 2005, 2010, and 2014.

Country	2000 US $ (million)	%	2005 US $ (million)	%	2010 US $ (million)	%	2014 US $ (million)	%
AUS	1,581	3.47	2,926	4.07	4,837	3.47	4,481	2.89
AUT	29	0.06	32	0.04	47	0.03	61	0.04
BEL	313	0.69	276	0.38	403	0.29	395	0.25
BGR	35	0.08	46	0.06	14	0.01	51	0.03
BRA	281	0.62	507	0.71	1,883	1.35	2,168	1.40
CAN	343	0.75	324	0.45	600	0.43	776	0.50
CHE	44	0.10	43	0.06	72	0.05	80	0.05
CHN	299,105	6.57	6,645	9.25	16,175	11.60	17,269	11.12
CYP	20	0.04	10	0.01	9	0.01	7	0.00
CZE	11	0.02	37	0.05	138	0.10	82	0.05
DEU	706	1.55	935	1.30	1,772	1.27	2,108	1.36
DNK	113	0.25	123	0.17	174	0.12	197	0.13
ESP	541	1.19	861	1.20	1,457	1.05	1,816	1.17
EST	1	0.00	6	0.01	24	0.02	62	0.04
FIN	64	0.14	93	0.13	85	0.06	77	0.05
FRA	370	0.81	416	0.58	668	0.48	845	0.54
GBR	729	1.60	657	0.91	941	0.67	896	0.58
GRC	40	0.09	68	0.09	103	0.07	96	0.06
HRV	4	0.01	7	0.01	20	0.01	14	0.01
HUN	72	0.16	53	0.07	65	0.05	75	0.05
IND	1,071	2.35	2,751	3.83	6,332	4.54	7,536	4.85
IRL	31	0.07	58	0.08	72	0.05	90	0.06
ITA	707	1.55	620	0.86	1,290	0.93	1,851	1.19
JPN	10,770	23.66	16,947	23.59	19,516	14.00	19,819	12.77
KOR	4,769	10.48	6,335	8.82	10,514	7.54	8,999	5.80
LTU	1	0.00	4	0.01	10	0.01	18	0.01
LUX	2	0.00	7	0.01	13	0.01	11	0.01
LVA	0	0.00	7	0.01	5	0.00	23	0.01
MEX	300	0.66	333	0.46	632	0.45	833	0.54
MLT	1	0.00	1	0.00	2	0.00	3	0.00
NLD	794	1.74	1,059	1.47	2,530	1.81	2,845	1.83
NOR	21	0.05	48	0.07	61	0.04	82	0.05
POL	45	0.10	84	0.12	183	0.13	315	0.20
PRT	21	0.05	60	0.08	72	0.05	83	0.05
ROU	9	0.02	27	0.04	26	0.02	66	0.04
RUS	33	0.07	111	0.15	551	0.40	615	0.40
SVK	4	0.01	16	0.02	46	0.03	20	0.01
SVN	28	0.06	32	0.04	86	0.06	74	0.05
SWE	43	0.09	98	0.14	86	0.06	95	0.06
TUR	171	0.38	524	0.73	988	0.71	1,757	1.13

TWN	1,697	3.73	2,003	2.79	7,063	5.07	6,913	4.45
USA	3,367	7.40	3,115	4.34	5,404	3.88	7,274	4.69
ROW	13,350	29.33	23,521	32.75	54,428	39.04	64,389	41.47
TOTAL	45,523	100.00	71,829	100.00	139,40 0	100.00	155,26 3	100.00

Source: Calculated from WIOT, result.

In the year of 2005, the highest percentages of Indonesian export were to the Japan (23.59%). Several other countries of destination that imported significant Indonesian goods and services in the year of 2005 were: (China 9.25%), Korea (8.82%), the USA (4.34%), Australia (4.07%), and India (3.83%).

In the year of 2010, the highest percentages of Indonesian export were to the Japan (14.00%). Several other countries of destination that imported significant Indonesian goods and services in the year of 2010 were: China (11.60%), Korea (7.54%), Taiwan (5.07%), India (4.54%) and Australia (3.47%).

In the year of 2014, the highest percentages of Indonesian export were to the Japan (12.77%). Several other countries of destination that imported significant Indonesian goods and services in the year of 2010 were: China (11.12%), Korea (5.80%), India (4.85%), the USA (4.69%), and Taiwan (4.45%).

During the year of study, the trend in increasing Indonesia export were export to China (6.57% in 2000, 9.25% in 2005, 11.60% in 2010 and 11.12% in 2014) and India (2.35% in 2000, 3.83% in 2005, 4.54% in 2010 and 4.85% in 2014. The trend of decreasing Indonesian export were export to Australia (3.47% in 2000, 4.07% in 2005, 3.47% in 2010 and 2.89% in 2014), Japan (23.66% in 2000, 23.59% in 2005, 14.00% in 2010 and 12.77% in 2014), Korea (10.48% in 2000, 8.82% in 2005, 7.54% in 2010 and 5.80% in 2014) and the USA (7.40% in 2000, 4.34% in 2005, 3.88% in 2010, and 4.69% in 2014).

Indonesian Import

Table 3 provides information on Indonesian import from other countries for the year of 2000, 2005, 2010 and 2014. Total import has increased from US$ 36,518 million in 2000 to US$ 61,670 million in 2005 (almost twice compared to that in 2000) to US$ 112,211 million in 2010 (almost twice compared to that in 2005) then to US$ 155,263million in 2014.In the year of 2000, highest Indonesian import was by Sector-26 (13.48%), meanwhile the lowest Indonesian imports were by Sector-23 (0.02%). Some sectors with significant percentage of import were: Sector-25 (9.45%), Sector-27 (8.87%), Sector-6 (7.41%), Sector-5 (6.71%), Sector-28 (5.77%), Sector-11 (4.20%), Sector-13 (3.87% %), Sector-10 (3.81%), Sector-15 (3.34%), Sector-20 (3.28%), Sector-8 (3.19%), and Sector-19 (3.08%).

In the year of 2005, the highest percentage of Indonesian import was by Sector-25 (11.43%); meanwhile the lowest Indonesian imports were by Sector-23 (0.00%). Some sectors with significant percentage of import were:

Sector-26 (8.57%), Sector-27(7.79%), Sector-28 (6.60%), Sector-20 (6.44%), Sector-5 (5.12 %), Sector-10 (4.88%), Sector-6 (4.72%), Sector-15 (4.67%), Sector-13 (3.97%), Sector-19 (3.45%), Sector-16 (1.50%), Sector-18 (3.61%), Sector-19 (4.72%), Sector-27 (4.63 %), Sector-28 (5.29%), Sector-29 (3.20 %), Sector-4 (3.12%), and Sector-24 (3.12%).

In the year of 2010, the highest percentage of Indonesian import was by Sector-25 (21.31%); meanwhile the lowest Indonesian imports were by Sector-23 (0.00%). Some sectors with significant percentage of import were: Sector-27 (8.30%), Sector-26 (8.10%), Sector-5 (6.08%), Sector-6 (5.08%), Sector-28 (4.90%), Sector-17 (4.79%), Sector-4 (4.35%), Sector-11 (3.63%), Sector-13 (3.58%), Sector-19 (3.31%), and Sector-10 (3.32%).

In the year of 2014, the highest percentage of Indonesian import was by Sector-25 (23.071%); meanwhile the lowest Indonesian imports were by Sector-23 (0.00%). Some sectors with significant percentage of import were: Sector-27 (9.11%), Sector-26 (7.85%), Sector-5 (7.07%), Sector-6 (5.36%), Sector-17 (4.19%), Sector-11 (3.98%), Sector-4 (3.77%), Sector-28 (3.56%), and Sector-13 (3.19%).

During the year of study, the trend of increasing percentage in Indonesian import occurred in Sector-4 (2.2% in 2000, 3.12% in 2005, 4.35% in 2010 and 3.77% in 2014), Sector-17 (2.52% in 2000, 2.73% in 2005, 4.97% in 2010 and 4.19% in 2014) and Sector-25 (9.45% in 2000, 11.43% in 2005, 21.31% in 2010 and 23.07% in 2014). The trend of decreasing percentage in Indonesian import occurred in Sector-8 (3.19% in 2000, 2.08% in 2005, 1.80% in 2010, and 1.58% in 2014), Sector-15 (3.34% in 2000, 4.67% in 2005, 2.23% in 2010 and 2.17% in 2014), Sector-20 (3.28% in 2000, 6.44% in 2005, 2.46% in 2014 and 2.51% in 2014), Sector-26 (13.48% in 2000, 8.57% in 2005, 8.10% in 2010 and 7.85% in 2014), and Sector-28 (5.77% in 2000, 6.60% in 2005, 4.90% in 2010 and 3.56% in 2014).

Table 3: Import by Sector in Indonesian economy: 2000, 2005, 2010, and 2014.

Sector	2000		2005		2010		2014	
	US $ (million)	%	US $ (million)	%	US $ (million)	%	US $ (million)	%
S-1	993	2.72	2,032	3.29	1,951	1.74	2,709	1.79
S-2	97	0.27	95	0.15	104	0.09	117	0.08
S-3	156	0.43	135	0.22	317	0.28	510	0.34
S-4	773	2.12	1,922	3.12	4,878	4.35	5,713	3.77
S-5	2,450	6.71	3,159	5.12	6,827	6.08	10,703	7.07
S-6	2,704	7.41	2,909	4.72	5,695	5.08	8,116	5.36
S-7	357	0.98	405	0.66	702	0.63	948	0.63
S-8	1,165	3.19	1,282	2.08	2,022	1.80	2,396	1.58
S-9	34	0.09	53	0.09	112	0.10	137	0.09
S-10	1,390	3.81	3,010	4.88	3,610	3.22	4,900	3.23

S-11	1,533	4.20	2,620	4.25	4,079	3.63	6,027	3.98
S-12	528	1.45	881	1.43	1,043	0.93	1,532	1.01
S-13	1,413	3.87	2,446	3.97	4,021	3.58	4,826	3.19
S-14	403	1.10	703	1.14	1,653	1.47	2,230	1.47
S-15	1,220	3.34	2,878	4.67	2,497	2.23	3,289	2.17
S-16	1,014	2.78	1,713	2.78	2,791	2.49	3,456	2.28
S-17	920	2.52	1,685	2.73	5,378	4.79	6,348	4.19
S-18	804	2.20	1,352	2.19	2,944	2.62	3,601	2.38
S-19	1,126	3.08	2,129	3.45	3,712	3.31	4,263	2.81
S-20	1,199	3.28	3,969	6.44	2,760	2.46	3,806	2.51
S-21	130	0.36	239	0.39	500	0.45	417	0.28
S-22	325	0.89	524	0.85	1,084	0.97	1,327	0.88
S-23	9	0.02	0	0.00	0	0.00	4	0.00
S-24	772	2.11	1,925	3.12	2,042	1.82	3,049	2.01
S-25	3,452	9.45	7,049	11.43	23,912	21.31	34,944	23.07
S-26	4,924	13.48	5,282	8.57	9,086	8.10	11,894	7.85
S-27	3,239	8.87	4,805	7.79	9,315	8.30	13,801	9.11
S-28	2,106	5.77	4,069	6.60	5,502	4.90	5,396	3.56
S-29	1,015	2.78	1,972	3.20	2,878	2.56	4,030	2.66
S-30	267	0.73	426	0.69	795	0.71	979	0.65
Total	36,518	100.00	61,670	100.00	112,211	100.00	151,467	100.00

Source: Calculated from WIOT, result.

Table 4 provides information on country of origin of Indonesian import from the year of 2000, 2005, 2010 and 2014. In the year of 2000, the highest percentages of Indonesian import were from neighbor countries such as: Japan (15.16%), and Korea (6.67%). The smallest Indonesian import was from countries such as Bulgaria (0.00%), Cyprus (0.00%), Estonia (0.00%), Croatia (0.00%), Lithuania (0.00%), Luxembourg (0.00%), Latvia (0.00%), Malta (0.00%), and Slovenia (0.00%). Several countries of origin that had exported significant Indonesian goods and services in the year of 2000 were: Australia (6.11%), the USA (5.59%) and China (4.66%).

In the year of 2005, the highest percentages of Indonesian import were from Japan (11.13%). Several other countries of origin that exported significant percentage of goods and services for Indonesia in the year of 2005 were: China (7.85%), Korea (5.85%, Australia (5.73%) and the USA (3.15%). In the year of 2010, the highest percentages of Indonesian import were from China (11.48%). Several other countries of origin that exported significant goods and services to Indonesia in the year of 2010 were from Japan (10.78%), Korea 96.48%), Australian (4.01%) and the USA (3.54%). In the year of 2014, the highest percentages of Indonesian import were from China (14.28%). Several other countries of origin that exported significant goods and services to Indonesia in the year of 2010 were from Japan (8.90%), Korea (7.04%), Australia (3.49%), and the USA (3.06%).

Table 4: Import by Country of Origin in Indonesian Economy: 2000, 2005, 2010, and 2014.

Country	2000 US $ (million)	2000 %	2005 US $ (million)	2005 %	2010 US $ (million)	2010 %	2014 US $ (million)	2014 %
AUS	2,231	6.11	3,531	5.73	4,496	4.01	5,279	3.49
AUT	119	0.33	92	0.15	194	0.17	234	0.15
BEL	184	0.51	232	0.38	361	0.32	353	0.23
BGR	1	0.00	10	0.02	24	0.02	29	0.02
BRA	387	1.06	929	1.51	2,433	2.17	3,092	2.04
CAN	428	1.17	578	0.94	640	0.57	975	0.64
CHE	179	0.49	196	0.32	358	0.32	357	0.24
CHN	1,701	4.66	4,842	7.85	12,877	11.48	21,627	14.28
CYP	0	0.00	0	0.00	1	0.00	1	0.00
CZE	6	0.02	39	0.06	56	0.05	186	0.12
DEU	960	2.63	1,260	2.04	2,043	1.82	2,403	1.59
DNK	66	0.18	101	0.16	321	0.29	214	0.14
ESP	193	0.53	163	0.26	291	0.26	418	0.28
EST	1	0.00	1	0.00	1	0.00	2	0.00
FIN	63	0.17	189	0.31	305	0.27	447	0.30
FRA	270	0.74	432	0.70	1,176	1.05	1,600	1.06
GBR	744	2.04	549	0.89	841	0.75	607	0.40
GRC	12	0.03	31	0.05	64	0.06	92	0.06
HRV	1	0.00	1	0.00	5	0.00	25	0.02
HUN	4	0.01	14	0.02	27	0.02	29	0.02
IND	555	1.52	1,448	2.35	2,516	2.24	3,576	2.36
IRL	64	0.18	74	0.12	81	0.07	95	0.06
ITA	262	0.72	395	0.64	549	0.49	1,001	0.66
JPN	5,535	15.16	6,864	11.13	12,100	10.78	13,479	8.90
KOR	2,434	6.67	3,606	5.85	7,270	6.48	10,665	7.04
LTU	0	0.00	0	0.00	10	0.01	6	0.00
LUX	2	0.00	8	0.01	3	0.00	5	0.00
LVA	0	0.00	0	0.00	2	0.00	1	0.00
MEX	47	0.13	52	0.08	101	0.09	107	0.07
MLT	0	0.00	0	0.00	1	0.00	1	0.00
NLD	450	1.23	346	0.56	846	0.75	751	0.50
NOR	22	0.06	55	0.09	129	0.11	130	0.09
POL	12	0.03	19	0.03	54	0.05	116	0.08
PRT	13	0.03	13	0.02	52	0.05	47	0.03
ROU	2	0.01	8	0.01	9	0.01	20	0.01
RUS	27	0.07	224	0.36	683	0.61	1,150	0.76
SVK	4	0.01	2	0.00	5	0.00	5	0.00
SVN	1	0.00	5	0.01	11	0.01	7	0.00
SWE	189	0.52	304	0.49	480	0.43	473	0.31

TUR	77	0.21	137	0.22	465	0.41	1,028	0.68
TWN	889	2.43	1,035	1.68	2,660	2.37	3,282	2.17
USA	2,041	5.59	1,940	3.15	4,001	3.57	4,635	3.06
ROW	16,340	44.75	31,944	51.80	53,669	47.83	72,919	48.14
TOTAL	36,518	100.00	61,670	100.00	112,21 1	100.00	151,46 7	100.00

Source: Calculated from WIOT, result.

During the years of study, the trend of increasing Indonesian import were import from China (4.66% in 2000, 7.85% in 2005, 11.48% in 2010 and 14.28% in 2014) and India (1.52% in 2000, 2.35% in 2005, 2.24% in 2010, and 2.36% in 2014). Meanwhile, the trend of decreasing Indonesian import were import from Australia (6.11% in 2000, 5.73% in 2005, 4.01% in 2010 and 3.49% in 2014), Germany (2.63% in 2000, 2.04% in 2005, 1.82% in 2010 and 1.59% in 2014), Great Britain/United Kingdom (2.04% in 2000, 0.89% in 2005, 0.75% in 2010, and 0.40% in 2014), Japan (15.16% in 2000, 11.13% in 2005, 10.78% in 2010 and 8.90% in 2014), and the USA (5.59% in 2000, 3.15% in 2005, 3.57% in 2010 and 3.06% in 2014).

Indonesian Balance of Trade

In total balance of trade between Indonesia and her partner had been surpluses in all years of study; 2000, 2005, 2010 and 2014. Table 5 provides information on trade balance by sector in Japan economy for the year of 2000, 2005, 2010 and 2014. In the year of 2000, trade balance in Indonesian economy was surplus by US$ 9,005 million. Sectorally, trade balances deficits were in Sector-1, Sector-2, Sector-3, Sector-5, Sector-6, Sector-9, Sector-12, Sector-16, Sector-19, Sector-20, Sector-22, Sector-23, Sector-24, Sector-25, Sector-26, Sector-27, Sector-28 and Sector-29. Other sectors had surplus balance of trade. In the year of 2005, trade balance in Indonesian economy was surplus by US$ 10,158 million. Sectorally, trade balance deficits were in Sector-1, Sector-6, Sector-9, Sector-12, Sector-16, Sector-18, Sector-19, Sector-20, Sector-22, Sector-24, Sector-25, Sector-26, Sector-27, Sect or-28, Sector-29 and Sector-30. Other sectors had surpluses balance of trade.

Table 5 Trade Balance by Sector inIndonesianEconomy (in million US$)

Sector	2000	2005	2010	2014	Remarks
S-1	-424	-788	849	-656	
S-2	-20	154	-12	20	
S-3	-26	45	138	64	
S-4	8,988	18,311	39,283	39,927	Surpluses in all years
S-5	-256	2,496	10,342	13,417	
S-6	-83	-229	-2,173	-3,264	Deficit in all years
S-7	3,485	2,727	2,345	3,535	Surpluses in all years
S-8	1,690	1,634	3,446	3,235	Surpluses in all years

S-9	-32	-50	-106	-118	Deficit in all years
S-10	5,536	5,753	8,143	6,052	Surpluses in all years
S-11	1,263	1,347	3,151	4,898	Surpluses in all years
S-12	-409	-655	-320	-513	Deficit in all years
S-13	814	1,673	5,967	7,559	Surpluses in all years
S-14	263	67	-809	-1,408	
S-15	466	817	7,436	5,997	Surpluses in all years
S-16	-410	-583	-1,706	-1,650	Deficit in all years
S-17	1,101	699	-1,871	-3,196	
S-18	43	-25	-486	-481	
S-19	-28	-657	-2,855	-3,048	Deficit in all years
S-20	-808	-2,964	-949	-1,108	Deficit in all years
S-21	51	310	591	469	Surpluses in all years
S-22	-112	-204	-585	-233	Deficit in all years
S-23	-9	0	0	-4	
S-24	-772	-1,925	-2,034	-3,040	Deficit in all years
S-25	-3,452	-7,049	-	-	Deficit in all years
			23,488	34,667	
S-26	-3,660	-4,082	-6,190	-9,571	Deficit in all years
S-27	-2,261	-1,901	-5,540	-	Deficit in all years
				10,954	
S-28	-1,085	-2,680	-2,421	-3,031	Deficit in all years
S-29	-964	-1,736	-2,590	-3,821	Deficit in all years
S-30	117	-346	-367	-613	
Total	**9,005**	**10,158**	**27,188**	**3,796**	**Surpluses in all years**

Source: Calculated from WIOT, result.

In the year of 2010, trade balance in Indonesian economy was surplus by US$ 27,188 million. Sectorally, trade balance deficits were in Sectorally, trade balances deficits were in Sector-2, Sector-6, Sector-9, Sector-12, Sector-14, Sector-16, Sector-17, Sector-18, Sector-19, Sector-20, Sector-22, Sector-24, Sector-25, Sector-26, Sector-27, Sector-28, Sector-29 and Sector-30. Other sectors had surpluses balance of trade. In the year of 2014, trade balance in Indonesian economy was surplus by US$ 3,796 million. Sectorally, trade balance deficits were in Sector-1, Sector-6, Sector-9, Sector-12, Sector-14, Sector-16, Sector-17, Sector-18, Sector-19, Sector-20, Sector-22, Sector-23, Sector-24, Sector-25, Sector-26, Sector-27, Sector-28, Sector-29 and Sector-30. Other sectors had surpluses balance of trade. During the year of study, sectors that had experienced trade deficits in all years of study were Sector-6, Sector-9, Sector-12, Sector-16, Sector-19, Sector-20, Sector-22, Sector-24, Sector-25, Sector-26, Sector-27, Sector-28 and Sector 29. Meanwhile, sectors that had experienced trade surpluses in all years of the study were Sector-4, Sector-7, Sector-8, Sector-10, Sector-11, Sector-13, Sector-15, and Sector-21.

Table 6 Trade Balance by Country Origin (in million US$)

Country	2000	2005	2010	2014	Remarks
AUS	-650	-605	341	-798	
AUT	-90	-60	-147	-173	Deficit in all years
BEL	129	44	42	42	Surpluses in all years
BGR	33	36	-10	22	
BRA	-106	-422	-550	-924	Deficit in all years
CAN	-86	-254	-41	-199	Deficit in all years
CHE	-134	-152	-286	-277	Deficit in all years
CHN	297,404	1,803	3,299	-4,358	
CYP	20	10	8	6	Surpluses in all years
CZE	5	-2	83	-104	
DEU	-254	-325	-271	-294	Deficit in all years
DNK	47	22	-147	-17	
ESP	348	698	1,166	1,398	Surpluses in all years
EST	0	5	23	60	Surpluses in all years
FIN	1	-96	-220	-370	
FRA	100	-16	-508	-755	
GBR	-15	109	100	289	
GRC	28	37	39	4	Surpluses in all years
HRV	4	6	15	-11	
HUN	68	40	39	45	Surpluses in all years
IND	516	1,303	3,816	3,960	Surpluses in all years
IRL	-33	-17	-9	-5	Deficit in all years
ITA	446	225	741	850	Surpluses in all years
JPN	5,235	10,084	7,416	6,340	Surpluses in all years
KOR	2,335	2,730	3,244	-1,666	
LTU	1	4	0	12	Surpluses in all years
LUX	0	-1	10	6	
LVA	0	7	4	22	Surpluses in all years
MEX	253	281	531	726	Surpluses in all years
MLT	1	1	1	2	Surpluses in all years
NLD	344	713	1,684	2,093	Surpluses in all years
NOR	-1	-7	-68	-48	Deficit in all years
POL	33	66	130	199	Surpluses in all years
PRT	9	47	20	36	Surpluses in all years
ROU	7	19	18	46	Surpluses in all years
RUS	5	-114	-132	-535	
SVK	1	14	41	15	Surpluses in all years
SVN	27	27	75	66	Surpluses in all years
SWE	-147	-206	-394	-378	Deficit in all years
TUR	94	386	523	729	Surpluses in all years
TWN	808	968	4,404	3,631	Surpluses in all years
USA	1,327	1,175	1,403	2,640	Surpluses in all years
ROW	-2,990	-8,423	760	-8,530	
TOTAL	9,005	10,158	27,188	3,796	Surpluses in all years

Source: Calculated from WIOT, 2016.

Table 6 provides information on trade balance by country of origin in Indonesian economy for the year of 2000, 2005, 2010 and 2014. In the year of 2000, trade balance in Indonesian economy was surplus by US$ 9,005 million. Spatially, trade balance deficits were trade with Australia, Austria, Brazil, Canada, Switzerland, Germany, Great Britain/United Kingdom, Ireland, Norway, Sweden and the Rest of the World. Trade with other countries had surplus balance of trade. In the year of 2005, trade balance in Indonesian economy was surplus by US$ 10, 158 million. Spatially, trade balances deficits were trade with Australia, Austria, Brazil, Canada, Switzerland, Czech, Germany, Ireland, Luxembourg, Norway, Russia, Sweden and the Rest of the World. Trade with other countries had surplus balance of trade.

In the year of 2010, trade balance in Indonesian economy was deficit by US$ 27,118 million. Spatially, trade balances deficits were with Austria, Bulgaria, Brazil, Canada, Switzerland, Germany, Denmark, Finland, France, Ireland, Norway, Russia, Sweden and the Rest of the World. Trade with other countries had surplus balance of trade. In the year of 2014, trade balance in Indonesian economy was deficit by US$ 3,796 million. Spatially, trade balances deficits were with Australia, Austria, Brazil, China, Switzerland, Czech, Germany, Denmark, Finland, France, Croatia, Ireland, Korea, Norway, Russia, Sweden and the Rest of the World. Trade with other countries had surplus balance of trade.

During the year of 2000 to 2014, Indonesia experienced trade deficit in all years when trading with Australia, Brazil, Canada, Switzerland, Germany, Ireland, Norway and Sweden. Indonesia experienced trade surpluses in all years of study when trading with Belgium, Cyprus, Spain, Estonia, Greece, Hungary, India, Italy, Japan, Lithuania, Latvia, Mexico, Malta, the Netherland, Poland, Portugal, Romania, Slovakia, Slovenia, Turkey, Taiwan and the USA.

Discussions

This section highlights some important findings. Firstly, Indonesian export had been increased significantly from US$ 45,523 million in the year of 2000 to US$ 71,829 in the year of 2005 (almost twice compared to that in the year of 2000) to US$ 139,400 million in the year of 2010 (almost three time compared to that in the year of 2000 to US$ 155,263 million in the year of 2014. Three important sectors in Indonesian export were Sector-4: Mining and quarrying (21.44% in 2000, 28.17% in 2005, 31.68 in 2010 and 29.40% in 2014), Sector-5: Manufacture of wood and of products of wood and cork, except furniture (4.82% in 2000, 7.87% in 2005, 12.32% in 2010 and 15.53%) and Sector-10: Manufacture of basic pharmaceutical products and pharmaceutical preparations (15.21% in 2000, 12.20% in 2005, 8.43% in 2010 and 7.05% in 2014). Three important countries of Indonesian export destinations include Japan (23.66% in 2000, 23.59% in 2005, 14.00% in 2010 and 12.77% in 2014), Korea (10.48% in 2000, 8.82% in 2005, 7.54% in 2010 and

5.80% in 2014) and China (6.57% in 2000, 9.25% in 2005, 11.60% in 2010, and 11.12% in 2014).Secondly, Indonesian import had also increased during the years of study from US$36,518 million in 2000 to US$ 61,670 million in 2005 (almost twice compared to that in the year of 2000) to US$112,211 million in 2010 (almost twice compared to that in the year of 2005) and to US$ 151,467 million in the year of 2014. Some important sectors in Indonesian import include sector-5: Manufacture of wood and of products of wood and cork, except furniture(6.71.82% in 2000, 5.12% in 2005, 6.08% in 2010 and 7.07%), Sector-6: Manufacture of paper and paper products(7.41% in 2000, 4.72% in 2005, 5.08% in 2010 and 5.36% in 2014), Sector-25: Construction (9.45% in 2000, 11.43% in 2005, 21.31% in 2014, and 23.07% in 2014).Three important countries of Indonesian import origin include Japan (15.16% in 2000, 11.13% in 2005, 10.78% in 2010 and 8.90% in 2014), Korea (6.67% in 2000, 5.85% in 2005, 6.48% in 2010 and 7.04% in 2014) and China (4.66% in 2000, 5.85% in 2005, 6.48% in 2010, and 7.04% in 2014).

Thirdly, trade balances in Indonesian economy during 2000 to 2014 were always surpluses. Trade surplus in the year of 2000 was US$9,005 million, in the year of 2005 was US$ 10, 158million, in the year of 2010 was US$27,188 million and in the year of 2014 was US$ 3,796 million. Sectorally, sectors that had experienced trade surpluses in all years of the study were Sector-4, Sector-7, Sector-8,

Sector-10, Sector-11, Sector-13, Sector-15, and Sector-21. Meanwhile, sectors that had experienced trade deficits in all years of study were Sector-6, Sector-9, Sector-12, Sector-16, Sector-19,

Sector-20, Sector-22, Sector-24, Sector-25, Sector-26, Sector-27, Sector-28 and Sector 29. Spatially, Indonesia experienced trade surpluses in all years of study when trading with Belgium, Cyprus, Spain, Estonia, Greece, Hungary, India, Italy, Japan, Lithuania, Latvia, Mexico, Malta, the Netherland, Poland, Portugal, Romania, Slovakia, Slovenia, Turkey, Taiwan and the USA. However, Indonesia experienced trade deficit in all years when trading with Australia, Brazil, Canada, Switzerland, Germany, Ireland, Norway and Sweden.

CONCLUSIONS

World input-output databased were very useful in providing export, import and trade balance data. Three conclusions could be drawn from this study. Firstly, Indonesian export to other countries tends to increase during the year of 2000 -2014. Sectorally, three important sectors in Indonesian export were Sector-4: Mining and quarrying, Sector-5: Manufacture of wood and of products of wood and cork, except furniture, and Sector-10: Manufacture of basic pharmaceutical products and pharmaceutical preparations. Spatially, three important countries of Indonesian export destinations include Japan, Korea, and China.

Secondly, Indonesian import from other countries has also increased during the year of study. Spatially, some important sectors in Indonesian import were Sector-5: Manufacture of wood and

of products of wood and cork, except furniture, Sector-6: Manufacture of paper and paper products and Sector-25: Construction Spatially, three important countries of Indonesian import origin include Japan, Korea, and China.

Thirdly, trade balances in Indonesian economy were surpluses in all years; 2000, 2005, 2010 and 2014. Sectorally, there were 8 sectors that experienced trade surpluses in all years of study and 13 sectors that experienced trade deficits in all years of study. Spatially, there were 22 countries in which Indonesian trade balance experienced surpluses in all years and 8 countries in which Indonesian trade balance experienced deficits in all years.

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Appendix 1: Sector Classifications

Sector Code	Descriptions
Sector-1	Crop and animal production, forestry, fishing and aquaculture
Sector-2	Forestry and logging activities
Sector-3	Fishing and aquaculture
Sector-4	Mining and quarrying
Sector-5	Manufacture of wood and of products of wood and cork, except furniture
Sector-6	Manufacture of paper and paper products
Sector-7	Printing and reproduction of recorded media
Sector-8	Manufacture of coke and refined petroleum products
Sector-9	Manufacture of chemicals and chemical products
Sector-10	Manufacture of basic pharmaceutical products and pharmaceutical preparations
Sector-11	Manufacture of rubber and plastic products
Sector-12	Manufacture of other non-metallic mineral products
Sector-13	Manufacture of basic metals
Sector-14	Manufacture of fabricated metal products, except machinery and equipment
Sector-15	Manufacture of computer, electronic and optical products
Sector-16	Manufacture of electrical equipment
Sector-17	Manufacture of machinery and equipment n.e.c.,
Sector-18	Manufacture of motor vehicles, trailers and semi-trailers
Sector-19	Manufacture of other transport equipment
Sector-20	Manufacture of furniture; other manufacturing
Sector-21	Repair and installation of machinery and equipment
Sector-22	Electricity, gas, steam and air conditioning supply
Sector-23	Water collection, treatment and supply; Sewerage & waste: collection, treatment and disposal
Sector-24	Electricity, gas and drinking water
Sector-25	Construction
Sector-26	Wholesale and retail trade and repair, accommodation and food service activities
Sector-27	Transportation, telecommunication, information and publication
Sector-28	Real estate, financial and corporate services
Sector-29	Legal & management consultancy, architectures & engineering, scientific research & development
Sector-30	Other service activities

Source: Aggregated from WIOT, 2016

Appendix 2: Country Abbreviations

No.	Acronym	Country included	No.	Acronym	Country included
1.	AUS	Australia	23.	IRL	Ireland
2.	AUT	Austria	24.	ITA	Italy
3.	BEL	Belgium	25.	JPN	Japan
4.	BGR	Bulgaria	26.	KOR	Korea
5.	BRA	Brazil	27.	LTU	Lithuania
6.	CAN	Canada	28.	LUX	Luxembourg
7.	CHE	Switzerland	29.	LVA	Latvia
8.	CHN	China	30.	MEX	Mexico
9.	CYP	Cyprus	31.	MLT	Malta
10	CZE	Czech Republic	32.	NLD	Netherlands
11.	DEU	Germany	33.	NOR	Norway
12.	DNK	Denmark	34.	POL	Poland
13.	ESP	Spain	35.	PRT	Portugal
14.	EST	Estonia	36.	ROU	Romania
15.	FIN	Finland	37.	RUS	Russia
16.	FRA	France	38.	SVK	Slovak Republic
17.	GBR	United Kingdom	39.	SVN	Slovenia
18.	GRC	Greece	40.	SWE	Sweden
19.	HRV	Croatia	41.	TUR	Turkey
20.	HUN	Hungary	42.	TWN	Taiwan
21.	IDN	Indonesia	43.	USA	United States
22.	IND	India	44.	ROW	Rest of the World

Source: Processed from WIOT, 2016