

Trade Integration Indonesia-ASEAN4 in AEC Era: A Case of Wood-based Products

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Abstract - The research was conducted to find out the level integration intensity using Grubel-Lloyd index. Moreover, since Horizontal and Vertical Intra-Industry Trade (IIT) could be distinguished, it was important to find out whether Indonesia-ASEAN4 IIT of wood-based products was in one of these categories. The Hufbauer index had been used as the measurement of product differentiation. Therefore, it could be the basic information for taking policy to boost Indonesia-ASEAN IIT for this industry. The data used comprise annual statistics of wood-based product export and import between Indonesia and ASEAN4 from 2010 to 2016 which were divided into eight categories of five digits ISIC. The Grubel-Lloyd index result shows that only ISIC 16102 has achieved strong integration, the others are still in mild and even weak integration. The Hufbauer index results show that all the values approached to zero, indicated that overall wood-based products traded by Indonesia-ASEAN4 are horizontally differentiated.

Keywords: intra-industry trade (IIT), wood-based product, product differentiation, trade integration

I. INTRODUCTION

The establishment of the ASEAN Economic Community (AEC) in 2015 is a major milestone in the regional economic integration agenda in ASEAN, offering opportunities in the form of an immense market and for over 622 million people. Since the first time AEC was proposed in 2007, ASEAN has become the third largest market in the world, increased intra-ASEAN trade nearly US\$1 trillion, and with the combined GDP of US\$2.6 trillion in 2014, ASEAN economy was the seventh largest in the world. In addition, Foreign Direct Investment inflow in ASEAN increased by 11% in 2014, compared to only 5% in

2007. (ASEAN, 2015).

Since the beginning, the end goal of AEC under blueprints 2016 has been the economic integration, through free flow of goods, services, investment, capital, and skilled labor. To achieve this goal, twelve priority integration sectors have been identified to accelerate economic integration. The twelve priority sectors are agro-based products, air travel, automotive, wood-based products, e-ASEAN, electronics, fisheries, healthcare, textile and apparels, tourism, and logistics. Some member countries agree to have the coordinator role for every sector, and each priority integration sector has its roadmap. In this case, Indonesia is the coordinator for automotive and wood-based products.

For the economic integration purpose, every member country must remove barriers to trade which are tariffs and non-tariffs barriers according to the Common Effective Preferential Tariffs for ASEAN Free Trade Area (CEPT-AFTA) Agreement for all the commodity categories.

The elimination of tariffs on all intra-ASEAN goods from 0% up to 5% has been fully implemented by 2010 for ASEAN-6 and by 2015 for Cambodia, Laos, Myanmar and Vietnam (CLMV). The implementation of the AEC Blueprint 2015 has been substantially achieved. The achievement of MEA scorecard per June 2015 has reached 91,1%. This achievement reflects that ASEAN and Indonesia have consistently fulfilled its commitments (Ridhwan et al., 2015). The basic concept of AEC 2025 is to deepen integration and highly cohesive ASEAN economy thus supports sustained high economic growth. Hence the concept of IIT is considered important to measure the level of ASEAN trade integration intensity. As previously mentioned, one of the priority programs for this integration is wood-based products.

IIT has been interpreted as the trade that occurs in industries and fall under the same industry classification, or for products, which are related

to one another, or products that use similar factors of production intensity (Krugman, 2015). This is possible to happen since some members of the ASEAN countries have geographically similar endowments and technology. These facts indicate that International trade in a monopolistic competitive industry has created trade in the same industrial classifications.

IIT is important to boost economic integration as the key for the growth of economy. For instance, economic integration in Kenya has provided opportunity for the country to expand private investments to get more value addition and diversification of its exports. Hence Kenya is able to maintain its economy in sustainable growth path (Kenya Institute for Public Policy Research and Analysis, 2017). One of the previous researches conducted in Africa shows that its future sustainable growth and development depend on the increasing of its intra-trade level and investment within the African continent. Some developments in intra-trade have happened in recent years. For instance, intra-trade in Africa is between 10% and 13% of total trade, the European Union (EU) has 60% of trade in EU members, ASEAN has an IIT rate at about 25%, while in North America, the intra-trade is at about 40%. The EU remains to have the highest rate of IIT (African Economic Outlook, 2017). The United Nations Economic Commission for Africa (UNECA) projects an increasing of 52% in intra-African trade by 2022 relatively to the levels in 2010 if the AfCFTA is implemented ("Afreximbank 2018 Audit", 2019).

Research on IIT for agri-food product in European Union (EU) market has found out that economic integration supports the increase in IIT for the new member states towards the UE-27 markets. It was also for measuring Vertical and Horizontal Intra-Industry Trade of the 11 new member states with EU by using the classical Grubel-Lloyd (GL) index with the data in the period 1999–2010. It has been found that the nature of their IIT is more vertically intra-trade (Jambor, 2014).

Another research finds out about Mexico. As the US main trading partner, its main exports to the USA are based on IIT. The products exported and imported in both countries have been focused on the automobile industry and telecommunications. Mexico's specialization in exporting the automobile and electronic products has created its comparative advantages to other countries, especially the US and China. It is also concluded that comparative advantages have a positive impact on the intra-industry trade of Mexico (Mendoza Cota, 2016).

The effect of regional integration agreement towards IIT has also found out by using gravity models as the determinants of it, for the 19 countries of Western Hemisphere for the period 1970–2014. Gravity models are used as a control for trade creation and diversion and IIT. The research analyzes the impact of Common Market of the South, Andean Community, Central American Common Market and North America Free Trade Agreement. It is found out

that IIT has a contribution to trade expansion, while export diversification negatively affects bilateral trade in these regional free trade agreements. (Martin-Mayoral, Carofilis, & Guijarro, 2016).

Based on these researches, it can be concluded that IIT has become an important solution for the trade between Indonesia and other ASEAN countries, as well as the existing inter-industry trade to boost ASEAN integration. This is because members of the ASEAN countries geographically have similar endowments and technology factors, similar culture and relatively close distance.

IIT is the result of specialization through product differentiation and economies of scale that created possibility for all member countries to trade within the same industries, although the resources and technology used in producing these goods are similar and even in tastes. The IIT measurement in turn becomes an indicator of the similarities and convergent of the trading nations in their block integration (Aturupane, Djankov, & Hoekman, 1999). Some researches on IIT by using Grubel-Lloyd index shows a low value for the ASEAN region, which means that trade is more of the inter-trade nature rather than intra-trade. However, from year to year the intra-industry trade index keeps increasing (Jha & Saha, 2011).

Research conducted by Jha & Saha (2011) shows that the total intra-trade for ASEAN-5 remained stable since the implementation of AFTA in 1995 to 2001, but then after that it has been increasing gradually, especially trade between Indonesia-Singapore, Indonesia-Thailand and Singapore-Philippines. Their research also finds out that the Asian crisis has not had a significant impact on the intra-industry trade among ASEAN-5. The existence of the increase in the intra-industry trade index in ASEAN indicates that trade integration in that region is increasing.

Another research conducted to measure the development of IIT ASEAN in 1990 and 2010. It is shown that in 1990 characteristic of IIT ASEAN was dominated by Malaysia and Singapore. In 1990, the combined shares of Singapore and Malaysia for IIT ASEAN were 69,2% and 78,5%, respectively. However, IIT ASEAN declined substantially in 2010. The combined shares of Singapore and Malaysia for intra-ASEAN exports and imports were 48,9% and 52,4%, respectively. Singapore plays a large portion of IIT ASEAN due to its role as a transportation and distribution hub in the ASEAN with developed transportation infrastructure such as seaports and airports.

Moreover, Singaporean people have a relatively high income per capita, which played a role in promoting its trade with other ASEAN countries. On the other hand, Malaysia is also another relatively high-income country. High income per capita is the main determinant of boosting demand for imports (Okabe & Urata, 2014).

Therefore, it becomes clear that there should be more in-depth research about the Indonesian capability to establish intra-industry trade with ASEAN4, which

is supported by the domestic output in the wood-based products.

II. METHODS

Grubel-Lloyd index suits the measurement of the integration intensity pursued for AEC 2025 by using it to calculate the IIT in ASEAN region. For the research, the using of Grubel-Lloyd index is to find out the integration intensity within ASEAN countries, and then to determine the impact of differentiated product toward IIT Indonesia-ASEAN4 (Singapore, Malaysia, Philippines, and Thailand). The reason for choosing these ASEAN4 is that export-import conducted by Indonesia and other ASEAN member countries is the greatest amount compare to other member countries.

The data used are secondary raw data, supplied by Biro Pusat Statistik of Indonesia (BPS) collected for wood-based product that are classified in 5 digits International Standard Industrial Classification (ISIC). The classifications are ISIC 16102 (manufacture of sawmilling and wood preserving), ISIC 16211 (manufacture of plywood, laminated plywood included decorative plywood), ISIC 16212 (manufacture of laminated plywood included decorative plywood), ISIC 16214 (manufacture of veneer sheets), ISIC 16221 (manufacture of carpentry and joinery), ISIC 16293 (manufacture of wood carving except furniture), ISIC 16299 (manufacture of other goods made from wood, rattan, cork and bamboo) and ISIC 31001 (manufacture of wood furniture). They are referred as Krugman, Dixit and Norman and the most preferred or the ideal variety terminologies from Krugman and Lancaster with a determinant that is called industry specific, obtains the understanding of horizontal IIT from the wording love of variety. Vertical IIT was proposed by Varley in 1981 that looked into the IIT from a different explain that the term IIT is understood as exchange between countries with products that are related to each other or that are strong substitutes in demand. The exchange of those products is the result of the same or similar production factor intensity. Krugman (2015) provides a definition for IIT as a two-way trade for goods that are in the same industrial classification standard. It occurs when each industry in each country produces different kind of goods using the same production factor intensity, but the products are differentiated by its attribute or different characteristic. *i*. These data are compiled as panel data with the year of 2010 to 2016 that are referred as *t*. All the data used here was raw data or unpublished.

The IIT model is based on product differentiation and can be distinguished into IIT horizontal and IIT vertical. Grubel and Lloyd differentiated between the two-way trade for goods that are substituting each other, which is called the Horizontal IIT, and for goods that are different in the level of the process into the final good, which is called the Vertical IIT. Greenaway, Hine and Milner then developed this definition further that horizontal IIT is trade for goods

that are different in their attributes, while vertical IIT involves good that are differentiated according to their quality. Some researchers have been conducted to investigate the features and determinants of the horizontal and vertical intra-industry trade (HIIT and VIIT, respectively). For information technology industry in Asian, the EU and the US markets, by using data from 1996 to 2005, it was found out that HIIT was more dominate than VIIT. But recently, the comparative advantage of these countries influenced significantly vertical specialization between Asia and the EU, while horizontal specialization dominated trade between Asia and the US (Byun & Lee, 2005; Chang, 2009; Chin, Yong, & Yew, 2015).

IIT in the research is calculated by using five digits ISIC disaggregate of wood-based products traded by Indonesia-ASEAN4 in 2010 to 2016. The Grubel-Lloyd formula has been used in many researches as follows:

$$IIT_i = (X_i + M_i) - |X_i - M_i| \quad (1)$$

where $i=8$, $t=7$, X_i and M_i each is the value of export and import of the same industry respectively and are calculated based on the value of the currency of the country under analyzed or the home country (Yoshida, 2013).

$$\text{The GL-index} = \left[\frac{(X_i + M_i) - |X_i - M_i|}{X_i + M_i} \right] 100 \quad (2)$$

The measurement results in variation from 0 to 100. This equation is the IIT Grubel-Lloyd Index which later are being used broadly by researchers in looking for the level of IIT between advanced countries and developing countries including IIT in the ASEAN region, and as the measurement of the intensity of trade integration (Yusefzadeh et al., 2015).

Krugman (2015) explained the phenomena for IIT product differentiation, increasing returns to scale, and monopolistic competition as an approach for the imperfect market structure. This is different from the theory for international trade for inter-industry trade that is based on the comparative advantage, which assumes a constant return to scale and homogeneous product. The IIT model does not show to us which country is producing what good in that industry, the one that is known is only that each firm within an industry in a country will produce differentiated products. In short, the IIT model can be written as:

$$IIT = f(SE, DP) \quad (3)$$

Where SE is the economies of scale variable and DP is the product differentiation variable. Product differentiation is calculated by using the Hufbauer index to find out how whether the products are horizontal differentiated.

$$\text{The Hufbauer index (HI)} = HI_i = \frac{\delta_{ijk}}{\mu_{ijk}} \quad (4)$$

Where j =Indonesia; k =Singapore, Malaysia,

Thailand, Philippines; σ = standard deviation of the unit export value of product i from country j (Indonesia) to country k (partner country); μ = average of unit export value of product i from country j to country k . The more HI value reaches 0 the product traded becomes more horizontally differentiated (Funke & Ruhwedel, 2001). The unit export value of product i is based on the f.o.b. value in real Rupiah. This measurement is also used in analyzing factors influencing intra-industry trade in the food sector in the ASEAN region, by using panel data (Takamatsu, 2016).

III. RESULTS AND DISCUSSIONS

The raw data of Indonesia-ASEAN4 export-import from 2010 to 2016 are used to calculate IIT of wood-based products by using Equation 1. The raw data of Indonesia's export to the ASEAN4 country members are shown in Figure 1.

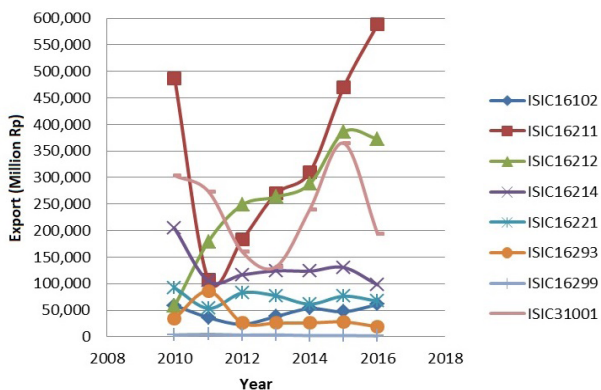


Figure 1 Indonesia's Export of Wood-Based Products to ASEAN4 in 2010-2016

The data show that Indonesia's export of wood-based products showing an increase in some products especially ISIC16102 (manufacture of sawmilling and wood preserving), ISIC 16211 (manufacture of plywood, laminated plywood included decorative plywood), and 16221 (manufacture of carpentry and joinery), while the others relatively stable or even decrease in 2016. For import, the data can be seen in Figure 2.

The data show that Indonesia imported product in ISIC16102 (manufacture of sawmilling and wood preserving) in large number. The good thing is it is decreasing in 2016. The second is ISIC 31001 (manufacture of wood furniture). Overall, the data reveals all imported goods decreasing in 2016, which is desired for every nation.

All the data are, then, used to calculate the measurement of the intensity of integration. By using the IIT formula on Equation 1, the result is provided in Figure 3.

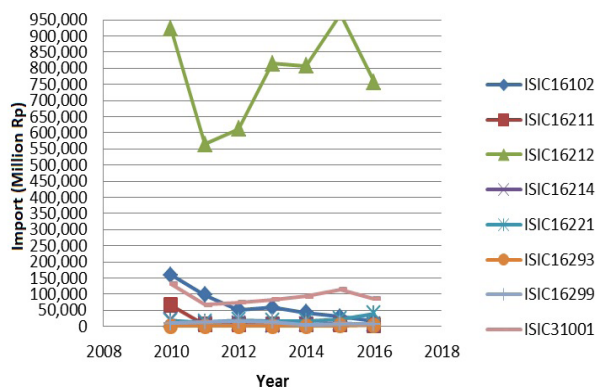


Figure 2 Indonesia's Import of Wood-Based Products from ASEAN4 in 2010-2016

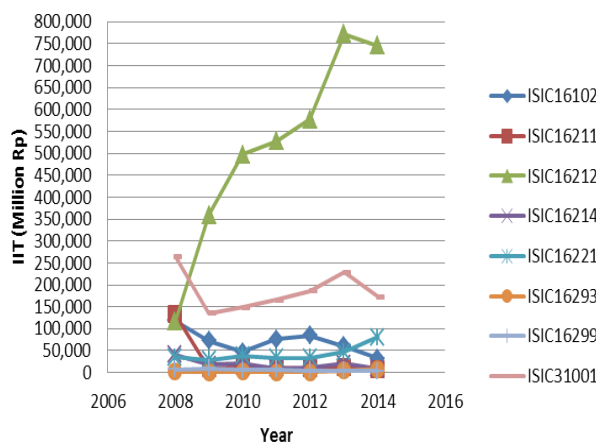


Figure 3 Indonesia-ASEAN4 Intra-industry Trade of Wood-based Products. The Result of Equation 1

To get the conclusion about the intensity of integration, the result is transformed to Grubel-Lloyd index as shown by Equation 2. The result of Equation 2 is provided in Table 1.

Table 1 GL-index and Integration Intensity of Wood-based Products, Indonesia-ASEAN4 in 2010-2016

ISIC Code	GL-Index	Integration Intensity
16102	82,38	Strong Integration
16211	7,83	Weak Integration
16212	49,62	Mild Integration
16214	13,21	Weak Integration
16221	45,06	Mild Integration
16293	8,66	Weak Integration
16299	44,87	Mild Integration
31001	44,87	Mild Integration

Source: Calculation Result of Equation 2

These data show that only product ISIC 16102 (manufacture of sawmilling and wood preserving)

have strong integration, between Indonesia and ASEAN4. It is indicated by the high amount of export and imports from both side counterparts, resulting in highest GL-index. ISIC 16211(manufacture of plywood, laminated plywood included decorative plywood), 16214 (manufacture of veneer sheets) and 16293 (manufacture of wood carving except furniture) have weak integration level due to the imbalances of export and import to and from ASEAN4. Import of ISIC 16211 is still larger than the export despite the decrease in 2016. Export for ISIC 16214 is much larger than import. The export is relatively stable for the year periods while import is decreasing. ISIC 16293 is dominated by Indonesia's export much larger than import from ASEAN4. These imbalances result in weak integration.

To support the integration, either export or import must be escalated. In the effort of increasing the value of output of the wood base products, it is necessary to increase the amount of domestic output to increase the volume of IIT between Indonesia and ASEAN4. Previous surveys showed that Indonesia remains to have large opportunity to market its products globally. Field observations also reveal the fact that wood-based products have no problem in relation to its market demand. The market remains considered wide-open, especially for products with particularly demand. The increase in price will not be a problem as long as the design and quality are accepted by the consumers. Hence there is an opportunity for the business expansion.

As the theory of IIT, that one of the determinants of IIT is product differentiation. The product differentiation results in Horizontal IIT or Vertical IIT. In order to find out the nature of Indonesia-ASEAN4 IIT, it is important to find out the criterion of the IIT itself. For this purpose, product differentiation is measured by Hufbauer index from Equation 4. The results are shown in Table 2.

Based on theory, the more HI value reaches 0, the traded product becomes more horizontally differentiated. Data in Table 2 indicate that overall wood-based products traded by Indonesia-ASEAN4 are horizontally differentiated. It means that the IIT of these products are different in their attributes. These traded products are similar in the quality but different in features such as shape and the number of types of the goods included in each ISIC.

In fact, Indonesia's wood-based products experience many new derivative products. When viewed in terms of the sustainability of exports, the actual export of Indonesia's forest products has increasingly diversified and has been able to create many new products. The Ministry of Environment and Forestry (KLHK) expressed optimism that exports of national wood products in 2018 will increase compared to previous years. In the last five years exports of national wood products have tended to increase (Neraca, 2018).

Table 2 Hufbauer Index Result for Indonesia-ASEAN4 IIT of Wood-based Products

ISIC Code	Name of Wood-based Product	Hufbauer Index
16102	Manufacture of Sawmilling and Wood Preserving	0,034
16211	Manufacture of Plywood, Laminated Plywood Included Decorative Plywood	0,060
16212	Manufacture of Laminated Plywood Included Decorative Plywood	0,045
16214	Manufacture of Veneer Sheets	0,125
16221	Manufacture of Carpentry and Joinery	0,020
16293	Manufacture of Wood Carving Except Furniture	0,059
16299	Manufacture of Other Goods Made from Wood, Rattan, Cork and Bamboo	0,037
31001	Manufacture of Wood Furniture	0,039

Source: Calculation Result of Equation 4

IV. CONCLUSIONS

The results of the IIT measurement show that overall Indonesia and the ASEAN4 countries counterparts are on mild trade integration. It means there are balances in the exported and imported trade products. Only three of the eight ISIC categories are in weak trade integration, due to the imbalances of export and import. For decorative plywood products (ISIC 16211), it has a quite large trade imbalance result in the very low export, therefore the export needs to be escalated. The number of domestic productions need to increase, although its relatively high production cost becomes one of the obstacles for global competitiveness for Indonesia's plywood manufacture products. More investment on this product is needed to increase its production. Another way to escalate is by the enforcement of Timber Legality Verification System issued by Indonesian Ministry of Environment and Forestry to tackle the sustainability issue.

The results of Hufbauer index also show that the criterion of the trade is in Horizontal IIT, meaning that these products are considered different in their attributes. The issue of the weather differences of each country can affect the quality of Indonesia's products of wood-based products. In this case, the IIT should be improved to the Vertical IIT where the exchanged goods vary in quality. For this reason, it is important to find out the impact of horizontal and vertical product differentiation on Indonesia-ASEAN4 IIT. Therefore, it is suggested there are further research about the impact of horizontal and vertical differentiated product on Indonesia-ASEAN4 IIT of wood-based products.

REFERENCES

- Afreximbank 2018 Audit. (2019). *Africa research bulletin: Economic, financial and technical series*. <https://doi.org/10.1111/j.1467-6346.2019.08856.x>.
- African Economic Outlook. (2017). African economic outlook 2017: Entrepreneurship and industrialisation. In *African Economic Outlook*. <https://doi.org/10.1787/aeo-2017-en>.
- ASEAN. (2015). *ASEAN Economic Community (AEC)*. 1-4.
- Aturupane, C., Djankov, S., & Hoekman, B. (1999). Horizontal and vertical intra-industry trade between Eastern Europe and the European Union. *Weltwirtschaftliches Archiv*, 135, 62-81. <https://doi.org/10.1007/BF02708159>.
- Byun, J. J., & Lee, S.-H. (2005). Horizontal and vertical intra-industry trade: New evidence from Korea, 1991-1999. *Global Economy Journal, De Gruyter*, 5(1), 1-31. <https://doi.org/10.2202/1524-5861.1036>.
- Chin, M.-Y., Yong, C.-C., & Yew, S.-Y. (2015). The determinants of vertical intra-industry trade in SITC 8: The case of ASEAN-5 and China. *Journal of Developing Areas*, 49(4), 257-270. <https://doi.org/10.1353/jda.2015.0128>.
- Funke, M. & Ruhwedel, R. (2001). Product variety and economic growth - Empirical evidence for the OECD Countries, *IMF Staff Papers*, 48(2), 225-242.
- Jambor, A. (2014). Country-specific determinants of horizontal and vertical intra-industry agri-food trade: The case of the EU new member states. *Journal of Agricultural Economics*, 65(3), 663-682. <https://doi.org/10.1111/1477-9552.12059>.
- Jha, A. K., & Saha, S. (2011). Intra-Industry Trade in ASEAN-5: An overall and country-specific study. *Journal of International Economics*, 2(2), 17-24.
- Kenya Institute for Public Policy Research and Analysis. (2017). Kenya economic report 2017. In *Sustaining Kenya's Economic Development by deepening and Expanding Economic Integration in the Region*. <https://doi.org/10.1007/s10842-006-7185-8>.
- Krugman, P., Obstfeld, M., & Melitz, M. (2015). In *International economics, theory and policy* (9th Ed., pp. 159-171). Boston: Pearson.
- Martin-Mayoral, F., Carofilis, G. M., & Guijarro, J. C. (2016). The effects of integration agreements in Western Hemisphere trade, 1970-2014. *Journal of International Trade and Economic Development*, 25(5), 724-756. <https://doi.org/10.1080/09638199.2015.1125519>.
- Mendoza Cota, J. E. (2016). Revealed comparative advantages and intra-industry trade changes between Mexico, China and the USA. *Portes*, 10(20), 8-41.
- Neraca. (February 5th, 2018). *Ekspor produk kayu nasional terus meningkat, target pendapatan USD12 miliar di 2018*. <https://economy.okezone.com/read/2018/02/05/320/1854836/ekspor-produk-kayu-nasional-terus-meningkat-target-pendapatan-usd12-miliar-di-2018>, revered 7 September 2019.
- Okabe, M., & Urata, S. (2014). The impact of AFTA on intra-AFTA trade. *Journal of Asian Economics*. <https://doi.org/10.1016/j.asieco.2014.09.004>.
- Ridhwan, M. M., Wicaksono, G., Nurliana, L., Bary, P., Suryani, F. T. and Satyanugroho, R. (2015). *Analisis daya saing dan strategi industri Nasional di era masyarakat ekonomi ASEAN dan perdagangan bebas, Bank Indonesia, WP/3/2015*. Retrieved from <http://www.bi.go.id/id/publikasi/wp/Documents/>, revered 21 April 2018).
- Takamatsu, M (2016). *Analysis of factors influencing intra-industry trade in the food sector in the ASEAN region, Food and agriculture organization of the United Nations, Graduate School of Agriculture Kyoto University (Japan)*. Retrieved from <http://agris.fao.org/agris-search/search.do?recordID=JP2019008579>.
- Yoshida, Y. (2013). Intra-industry trade, fragmentation and export margins: An empirical examination of sub-regional international trade. *North American Journal of Economics and Finance*, 24(C), 125-138. <https://doi.org/10.1016/j.najef.2012.07.003>.
- Yusefzadeh, H., Rezapour, A., Lotfi, F., Ebadifard Azar, F., Nabilo, B., Abolghasem Gorji, H., ... Karami, A. (2015). A study of comparative advantage and Intra-Industry Trade in the pharmaceutical industry of Iran. *Global Journal of Health Science*, 7(6), 295-307. <https://doi.org/10.5539/gjhs.v7n6p295>.