Comparative Advantage Measurement in ASEAN's Ten Leading Export Commodities: A Case Study of ASEAN-5

Estira Woro Astrini[1], Nurul Azizah Az zakiyyah[2]

[1] *Magister Science of Economics, Faculty of Economics and Business, Gadjah Mada University*
[2] *Non Functional Budget State Analys Setjen DPR RI*

Article Info	Abstract
	This paper analyzed ASEAN-5's comparative advantage of their best ten products using "products mapping" as now we faced ASEAN Economic Community (AEC). Its a need to know which commodities are those countries in comparative advantage and as a net exporter. Using data retrieved from UN COMTRADE accessed from INTRACEN website, we used information of best ten ASEAN's leading export commodities which was under 2 digits HS classsification. For analysis in this paper, we derived those products into 4 digits HS classification, so then we were not only use 10 commodities but 320 commodities. Comparative advantage measurement that we used were Revealed Symmetric Comparative Advantage (RSCA), as for know if the countries were net-importer or net-exporter we used Trade Balance Index (TBI). Lastly, we combined those two indexes of comparative advantage to draw each country's products mapping. From the analysis, we got the result that, Indonesia's exported commodities (net-exporter) and comparative advantage mostly are from animal or vegetable fats and oil, Malaysia's mostly are from rubber and articles thereof, Singapore and Thailand's mostly from organic chemicals, and Philipines's mostly from electrical and electrical equipment.

INTRODUCTION

More than a decade ago, right after the crisis that hit South East Asia countries, each of ASEAN Heads of State agreed on the establishment of the ASEAN Community (ASEAN community) in the Politics Security (ASEAN Political-Security Community), Economics (ASEAN Economic Community), and Social and Cultural (ASEAN Socio-Culture Community). ASEAN Economic Community that had been agreed in advanceis an ASEAN economic integration formed to face the free trade amongst ASEAN countries. Although ASEAN Economic Community had been agreed for a long time ago but it started to proceed in late 2015. Economic integration has done in order to increase the competitiveness of ASEAN countries as well as to compete along with China and India as ASEAN rivals to attract foreign investment. Foreign investment in the region was needed to boost employment and improve welfare.

ASEAN Economic Community should allow the free movement of goods, services, skilled labor and investment and to facilitate capital flows more freely among the ten ASEAN member countries. In order to achieve this objective, the ASEAN Economic Community created the ASEAN Economic Community Blueprint which is a master plan for the implementation of the ASEAN Economic Community outlining targets and timelines.

The four key elements of the ASEAN Economic Community (AEC) Blueprint for economic integration they were: (1) a single market and production base (free flow of goods, free flow of services, free flow of investment, a freer flow of capital, free flow of skilled labor, priority integrated sectors, food, agriculture, and forestry), (2) A competitive economic region (competition policy, consumer protection, intellectual property rights, inftrastucture development, taxation, e-commerce), (3) Equitable economic development (SME development, the Initiative for ASEAN Integration (IAI) designed to narrow the development gap between members and accelerated integration of Cambodia, Laos, Myanmar, and Vietnam), (4) Integration into the global economy (coherent approach to external economic relations, and enhanced participation in global supply network).

According to the US Commercial Service, the establishment of ASEAN as a single marketplace and a very important production center this because of : $ 2.3 trillion economy, 600 million people, hundreds of millions of middle class consumers, ASEAN is the second fastest growing economy in Asia between 2001 -2013 (behind only China), ASEAN is the largest economy in Asia and 7th globally, $ 5.3 trillion in global trade, and $ 1 trillion infrastructure investment needed through 2020.

In international trade, ASEAN has many trading partners. According to the US Commercial Service, the countries that are the main trading partner of ASEAN are China, countries of the European Union (EU), and Japan. Based on data from the International Trade Center (ITC), the top five export commodities of ASEAN countries in 2013 are (1) electrical, electronic equipment, (2) mineral fuels and oils, (3) machinery, (4) vehicles and (5) plastics and plastic products. Meanwhile, based ASEANstats, ASEAN Secretariat, Deutsche Bank and DB Research as reported in the US Commercial Service, ASEAN's key imports and exports commodities are (1) electronic and electrical machinery, (2) mineral fuels and oils, (3) nuclear reactors , machinery and appliences, (4) rubber and Articles, (5) business services and miscllanous repairs, (6) animal or vegetable oils and products, (7) plastics and Articles, (8) other organic chemicals, (9) vehicles and parts, (10) precious stones and jewelry, and (11) iron and steel.

To examined the comparative advantage from the export commodities, most of research used Revealed Comparative Advantage (RCA), Revealed Symmetric Comparative Advantage (RSCA), or Trade Balance Index (TBI) separately as their analytical tools. Yilmaz (2003) used RCA to analyzed the international competitiveness in Turkish economy and foreign trade specialization. Valle and Alberqueque (2009) used RCA to examined the comparative

advantages of soybeans and beef Goias Brazil in trade flows with MERCOSUR. Akhtar, et al (2009) used RCA to examined the changing comparative advantage for the footwear industry in Pakistan with India, China, Indonesia, and Thailand. This paper not only used RCA to analyzed the comparative advantage from export commodities, but we used combination of RSCA, RSCA is modifications from Balassa's RCA index who made by Laursen (1998). The result of the modification is an index of Revealed Symmetric Comparatie Advantage (RSCA), which has a range of different values with RCA and its value becomes more symmetric, i.e a value between -1 and +1. To see if a country has a comparative advantage in a product (export commodity) and TBI to see if a country specializes in export (net-exporter) of specializes in import (net-importer), this combination between two indexes called as Product mapping. Widodo (2009) used this methodology to analyzed comparative advantage of ASEAN export commodities. The differences between this paper from the literatures before was we used the product mapping as analytical tools to examined both comparative advantage and specialization, the export commodities that we choose to analyzed determined by ASEAN's top ten export commodities by International Trade Center and US Commercial Services, and the study period was between 2001 to 2016.

This paper examined the comparative advantage of the top ten export commodities in ASEAN countries which under 2 digits HS classification, but for analysis in this paper we derived it into 4 digits HS classification . Then lastly, we also will mapping the comparative advantages of top commodity export in ASEAN countries.

THEORITICAL BASIS
The Ricardian Model
David Ricardo introduced a concept called the theory of comparative advantage through his work, *The Principles of Political Economy and Taxation*, in 1817. The theory of comparative advantage by David Ricardo is a critique of the theory of absolute advantage by Adam Smith who argue that international trade will only happen if there is differences between the absolute advantage in both countries. Ricardo argued that international trade does not always happen because of differences in the absolute advantages , but also because of their comparative advantages. Ricardo (1987) in Widodo (2009) stated that the principle of comparative advantage postulates that a nation will export the goods or services in which they have greatest comparative advantage and import those in which they have the least comparative advantage.

According to Appleyard and Field (2001) in Widodo (2009), the Ricardian model is based on several strict assumptions: (1) fixed endowment of (identical) resources, (2) factors of production are completely mobile between alternative uses within a country, (3) factors of production are completely immobile externally, (3) a labor theory of value is employed in the model, (4) the level of technology is fixed for both countries, (5) unit costs of production are constant, (6) there is full employment, (7) perfect competition, (8) no government-imposed obstacles to economic activity, (9) internal and external transportation costs are zero, (10) for simple analysis: a 2-country, 2-commodity "world".

In this Ricardian models, trade will benefit both countries if each of the parties to specialize and to export commodities that can be produced efficiently, as well as the import of commodities whose production is less efficient.

### The Heckser-Ohlin Theorem
This Theory is the development of David Ricardo's theory of comparative advantage that is based on ownership of factor production. According to Salvatore (2007) in Shahibul (2013), H-O theory is based on assumptions, (1) there are two countries (country 1 and 2), two commodities (X and Y), and two factors of production (labor and capital); 2x2x2, model, (2)

constant return to scale and identical technology, (3) commodity X is labor-intensive and commodity Y is capital-intensive, (4) the two commodities are produced in a constant return to scale for both countries, (5) there is an incomplete specialization in production for both countries, (6) factor production is completely immobile accross international border but can move costless among industry within the country (7) equal goods and factors, and tastes for both countries, (8) there are no transportation cost, tariffs, or other obstruction to the free flow of international trade, (9) all resources are fully employed in both countries, and (10) international trade between the two countries is balanced.

In H-O's theory, a country will export the commodities which produced by the cheap and abundant factor production, and it will import the commodities which factors of production is relatively more scarce and expensive domestically. A country is said to be capital-abundant if the country specializes in the export of capital-intensive goods and import labor-intensive goods. Specialization in international trade will benefit both parties.

Akamatsu Flying Geese

In 1961, Akamatsu published a model called Flying Geese (FG) model which describes the process of catching up the industrialization in developing countries against developed countries
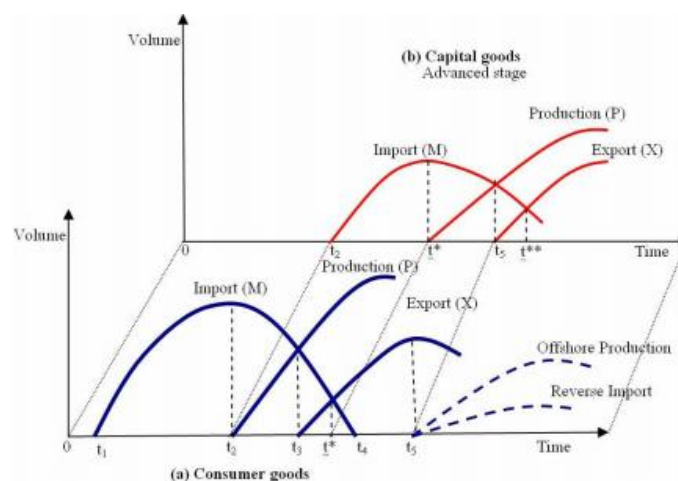
Figure 1 *Flying Geese Paradigm: Import-Production-Export-Reverse Import*
Source: Kojima (2000) in Widodo (2009).

According to Kojima (2000) in Shahibul (2013), the process of the Flying Geese (FG) model comprise with four phases : (1) developing and emerging countries to import consumer goods from developed countries, (2) At the time t_2, begins production in the country and began to import capital goods from developed countries or the so-called import substitution, (3) t_2t_3 is the stage of decline in imports of consumer goods and preparation for export. t^* condition is an equilibrium (export=import). So that domestic demand is influenced by domestic production, imports, and exports, (4) last step is the opposite of the first phase, developing countries began to export capital goods (t_5) over with the decline of consumer goods exports.

Product Mapping

Widodo (2009) argued that there are two point of views to explained leading exported products. First, from the *domestic point of view* leading exported products are meant as exported products that can give bigger amount of foreign exchange for domestic economy. Second, from

international competition point of view, leading exported products that have comparative advantage in the international market. Both point of view that stated above, presented in the analytical tool, namely "Product Mapping". The indicator used to represent domestic trade-balance was Revealed Symmetric Comparative Advantage (RSCA) and indicator to represent international competitiveness (export-import activities) was Trade Balance Index (TBI).

LITERATURE STUDIES

There were some research that inspect about comparative advantage in some countries and commodities :

Table 1. *Literature studies*

Literature	Outcomes
Yilmaz (2003)	• Analyzed the international Competitiveness economy and foreign trade specialization structure with comparisons against five EU candidate countries, namely Bulgaria, Rep. Ceko, Hungary, Romania, and Poland with fifteen members of the European Union. • Analytical tool used in this research was *Revealed Comparative Advantage (RCA)*, *Comparative Export Performance* (CPE), *Trade Overlap* (TO), dan *Export Similarity* (ES). • The data used is the data from the SITC classification that divided into five groups: (1) *raw material- intensive goods*, (2) *labour intensive goods*, (3) *capital-intensive goods*, (4) *easily imitable-research oriented goods*, (5) *difficultly imitable research-oriented goods*. • The results of the research are: (1) Turkey, Bulgaria, Rep. Ceko, Hungary, Romania, and Poland has a comparative advantage in the export of labor-intensive goods. Turki itself has a strong comparative advantage in raw material-intensive goods and labor-intensive goods. • Fifth other countries have a comparative advantage in the export of raw material-intensive goods. Turkish
Valle and Alburqueque (2009)	• Examining the comparative advantages of soybeans and beef Goias Brazil in trade flows with MERCOSUR and tried to test the hypothesis of strengthening regional integration, the Goias- MERCOSUR. • The study period is 2000-2008. • The analysis tool used is the Revealed Comparative Advantage (RCA) and the Regional Orientation Index (ROI). • The results of the analysis using RCA stated that Goias specialization for commodities soy beans and beef directly have a role in the growth of exports in the last ten years. • Results with using ROI analysis showed that the majority of destinations from the export of soybeans and beef Goias are countries outside MERCOSUR
Akhtar, et al (2009)	• Research about changing comparative advantage for the footwear industry in Pakistan with China, India, Indonesia, and Thailand in period from 1996 to 2006. • The data used is data with a classification Harmonized System (HS) 96 digits 2 and 4. • The analytical tool used in this research is the Revealed Comparative Advantage (RCA).

	• Research results show that the footwear industry in Pakistan has a comparative advantage compared to China and India. It can be the foundation as an opportunity to increase the export of footwear as an additional source of income in Pakistan.
Widodo (2009)	• Perform a combination of the two analytical tools of comparative advantage that is Revealed Symmetric Comparative Adantage (RSCA) with Trade Balance Index (TBI), the result of the combination called product mapping is an analytical tool used to analyze the export commodities in ASEAN countries. • The study period was from 1985 to 2005. The data used is the data classification system SITC Rev 2 with 3 digits are derived from UN COMTRADE. • The results showed that the higher the comparative advantage for a particular product, the greater the country to become a net exporter, meaning that there is a positive relationship between the comparative advantage of the trade balance.
Shohibul (2013)	• Investigated the comparative advantage of ASEAN countries and China using Revealed Symmetric Comparative Advantage (RSCA) and Trade Balance Index (TBI) approach. • Export products are analyzed based on SITC re. 3 classification, which is divided into primary products and manufactured products • The results showed that China has more established patterns of trade, while ASEAN trade pattterns are very dynamic.

DATA AND METHODOLOGY
Data

This research will use export and import data of ASEAN countries and using the period of 2001-2016. The data retrieved from UN COMTRADE accessed from International Trade Center's website. Commodities used in this study based on top ten export commodities in ASEAN countries under the classification system of the 2 digits Harmonized System (HS) and the data we'll processed were in product cluster at 4 digits HS based on those commodities:

Table 2 *Top Ten ASEAN Leading Export Commodity*

HS 2-Digits	Commodities
15	Animal or vegetable fats and oils and their cleavage product; prepared edible fats; animal or vegetable waxes
27	Mineral fuels, mineral oils and products of their distillation, bituminous substances, mineral waxes
29	Organic chemicals
39	Plastics and articles thereof
40	Rubbers and articles thereof
71	Natural or cultured pearls, precious or semi precious stones, precious metals, metal clads with precious metals, and

	articles thereof, imitation jewelry, coins
72	Iron and steel
84	Nuclear reactors, boilers, machinery and mechanical appliances: part thereof
85	Electrical, electronic equipment
87	Vehicles other than railway or tramway rolling stock and part and accessories thereof

Source : International Trade Centre and US Commercial Service

Since we used the 4 digits HS based on those commodities, in this paper we derived the commodities into 4 digits HS, so then we focused on 320 commodities that we will processed further.

Methodology
Revealed Comparative Advantage

Revealed Comparative Advantage (RCA) is a way to find out the comparative advantages of a country. The analysis tool was first developed by Balassa in 1965 and defined as a ratio among certan export products of a country's overall esports to total world export (Volrath, 1991), with the formulation as follows:

$$B_{ij} = \frac{X_{ij} / X_{wj}}{X_i / X_w}$$

Source : Balassa in Sanidas and Shin (2010)

B_{ij} = Balassa index (RCA) Country i for commodity j

X_{ij} = Country i's export for commodity j

X_i = total commodities exported by country j

X_{wj} = world export for commodity j

X_w = total commodities exported by world

A nation i will be said to have a comparative advantage in commodities j if the size of the commodity markets j from country i to the market size of the national export total is greater than the size of the world export market for commodity j to the size of the total world export market, it can be demonstrated by the value of Balassa index (B_{ij}) greater than one. And conversely, a state i is said to have a comparative advantage in commodity j if the Balassa index (B_{ij}) is smaller than one.

The calculation of RCA by Balassa criticized by Vollrath (1991), because of the double counting that includes country i and commodity j in the denominator. Thus, Widodo (2010) in Williem conducted a study calculatingRCA in the absence of such double counting. Formulation RCA in Widodo's version
(2010) :

$$RCA_{ij} = \frac{-\dfrac{X_{ij}}{\Sigma_i X_{ij}}}{\dfrac{X_{iw}}{\Sigma_i X_{iw}}}$$

Source : Widodo (2010) in Williem (2012)

RCA_{ij} = RCA country j for commodity i

X_{ij} = export country j for commodity i

$\Sigma_i X_{ij}$ = total export in country j's withput commodity i

X_{iw} = commodity i exported in the world without country j

$\Sigma_i X_{iw}$ = total export in the world withput commodity i country

  The RCA index has a range of values between 0 and infinity. RCA-value greater than one indicates that the country *j* has a comparative advantage in commodities *i*. In contrast, the value of RCA that is worth less than one indicates that the country j does not have a comparative advantage in commodities *i*.

Revealed Symmetric Comparative Advantage
  Laursen (1998)made modifications to Balassa's RCA index. The result of the modification is an index of Revealed Symmetric Comparatie Advantage (RSCA), which has a range of different values with RCA and its value becomes more symmetric, i.e a value between -1 and +1. RSCA index Laursen:

$$RSCA_{ij} = \frac{RCA_{ij} - 1}{RCA_{ij} + 1}$$

  If RSCA is greater than zero then j country has a comparative advantage in product i, whereas if the value of RSCA is less than zero then the state j does not have a comparative advantage in product i.

Trade Balance Index
  Trade Balance Index is an index created by Lafay (1992) to see if a country specializes in exports (net exporters) or in imports (net importer)for a particular product. Formulation of TBI are as follows:

$$TB_{ij} = \frac{X_{ij} - M_{ij}}{X_{ij} - M_{ij}}$$

Source : Lafay (1992) in Widodo (2009)

TB_{ij} = Trade Balance Index Country i for commodity j

X_{ij} = Export commodity j to the world by coutry i

M_{ij} = import commodity j from the world by country i

  TBI value ranges from -1 to +1. TBI value of -1 indicates that a country importing only. Instead, if TBI value equal to +1 it shows that a country can only export. Meanwhile, if the value of

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TBI range between -1 and +1 shows that a country export and import of a product simultaneously. A country is said to be a net importer on a certain commodity when TBI negative value and is said to be net exporters if the value is positive.

Product Mapping

Product mapping is a combination between RSCA index with TBI by Widodo (2009). Commodities mapped into four groups: A, B, C, and D. Group A consists of commodities that have a comparative advantage and specializing in exports. Group B consists of commodities that have a comparative advantage but do not specialize in exports. Group C consists of commodities that specialize in export but do not have a comparative advantage. Group D consists of commodities that do not have a comparative advantages and do not specialize on exports.

Group B Comparative advantage Net-importer RSCA>0>and TBI<0	**Group A** Comparative Advantage Net-exporter RSCA>0 and TBI>0
Group D Comparative Disadvantage Net-importer RSCA<0and TBI<0	**Group C** Comparative Disadvantage Net-Exporter RSCA<0 and TBI>0

Figure 2. *Products Mapping*
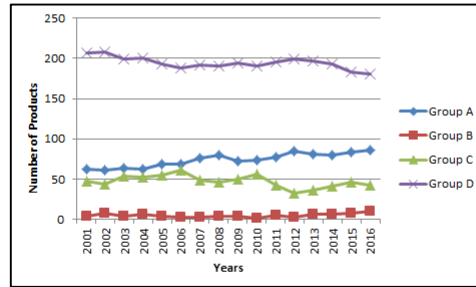**Trade Balance Index (TBI)**
Source : Widodo (2009)

EMPIRICAL RESULT
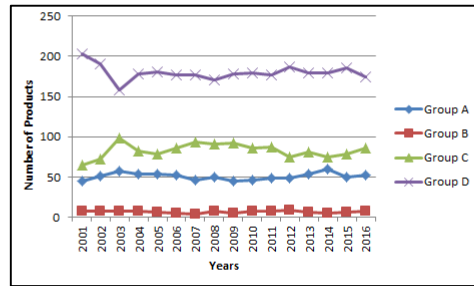**Product Mapping in ASEAN's Countries Exports**

Product mapping was constructed by using RSCA and TBI indexes. As mentioned before, that the products (HS 4) were categorized into four groups, A, B, C, and D as depicted in Figure 3.
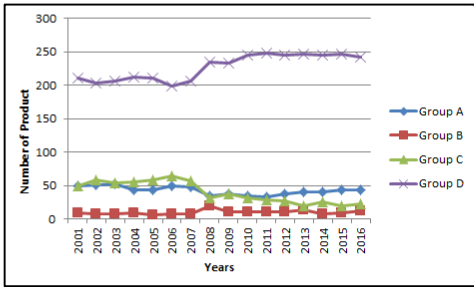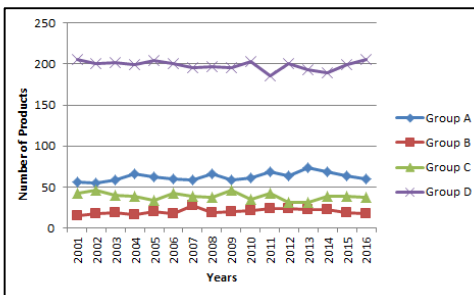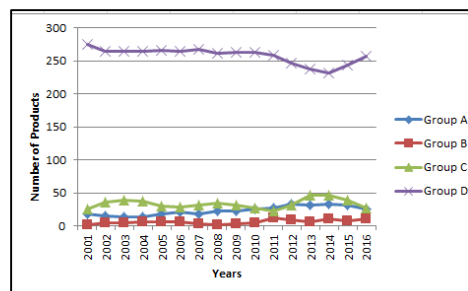
(a) Indonesia   (b) Malaysia

(c) Singapore

(d) Thailand   (e) Philipines

Figure 3 *Trends in the Number of Products in Each Group A, B, C, and D*
Source : UN COMTRADE Acessed from INTRACEN, author's calculation

Group A, consist of products, which have both comparative advantage and export specialization; Group B, consist of products which have comparative advantage but no export specialization; Group C consist of products which have no comparative advantage but have export specialization; and lastly Group D consist of products which have neither comparative advantage nor export specialization. Malaysia, Thailand and Philipines have relatively similar trends in number of products in each group i.e decreasing in Group D. Indonesia in the other hand shows relatively increasing trends in the number of products in Group D, and Singapore shows relatively steady trends in the number of products in each group.Table 3 shows the average number of products (4 digits HS) in the group A, B, C, and D of the "products mapping" in ASEAN countries in 2016 since we want to know which countries that have more exported product in top ten export ASEAN's commodities to see the comparative export between countries to face ASEAN Economic Community (AEC).

Table 3 The average number of products in each group A, B, C, and D for 2016

Group A			Group B		
Indonesia	44	(13.8%)	Indonesia	12	(3.8%)
Malaysia	86	(26.9%)	Malaysia	10	(3.1%)
Singapore	52	(16.2%)	Singapore	7	(2.2%)
Thailand	60	(18.8%)	Thailand	18	(5.6%)
Philipines	26	(8.1%)	Philipines	10	(3.1%)
Average All	53.6	(16.8%)	Average All	11.4	(3.6%)
Group C			**Group D**		
Indonesia	22	(6.9%)	Indonesia	242	(75.6%)
Malaysia	43	(13.4%)	Malaysia	181	(56.6%)
Singapore	86	(26.9%)	Singapore	175	(54.7%)
Thailand	37	(11.6%)	Thailand	205	(64.1%)
Philipines	27	(8.4%)	Philipines	257	(80.3%)
Average All	43	(13.4%)	Average All	212	(66.3%)

Product mapping was constructed by using RSCA and TBI indexes. As mentioned before, that the products (HS 4) were categorized into four groups, A, B, C, and D as depicted in Figure 3. In 2016, around 66.3 percent of the number of ASEAN's exported products are in the group D (products have no comparative advantage and country is a net importer), and there are about 16.8 percent, 3.6 percent, and 13.4 percent of the number of products in the Group A, B, and C respectively. The dominance of Groups D and A (together around 83.1 percent in the number of products) indicates a strong relationship between comparative advantage and the position of a country in the international market, as a net importer or a net exporter (Widodo 2009).

**Table 4** *"Products Mapping" for ASEAN-5 Countries in 2016*

Products Mapping	Top Ten Products (2016)	
	1.	**Indonesia**
	HS	*Commodity Description*
	1511	Palm oil & its fraction
	1513	Coconut (copra),palm kernel/babassu oil & their fractions
	2702	Lignite w/n agglomerated, excl jet
	4001	Natural rubber,balata,gutta-percha etc
	1520	Glycerol (glycerine)
	7201	Pig iron and spiegeleisen in pigs
	2701	Coal; briquettes, ovoids & similar solid fuels manufactured from coal
	1517	Margarine
	1516	Animal or veg fats, oils&fract, hydrogenated
	2927	Diazo-, azoor azoxy-compounds
	2.	**Malaysia**
	HS	*Commodity Description*
	4014	Hygienic/pharmaceutical art of vulcanised rubber
	8469	Typewriters and word-processing machines
	8485	Machinery parts,not containing elec connectors,coils,nes
	8520	Magnetc tape recorder & sound rec app
	8524	Recorded tape, recorded for sound
	8540	Thermionic,cold cathode valves&tube (e.g. tv camera tubes)
	8442	Machinery,app&equip for type-setting;printing type,plates
	8539	Electric filament or discharge lamps
	8435	Presses,crushers&sim machinery used in the mfr of wine/fruit juices

	2715	Bituminous mixtures from..natural asphalt, natural & petroleum bitumen
	3.	**Singapore**

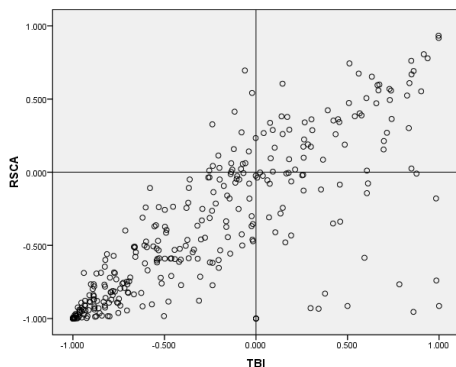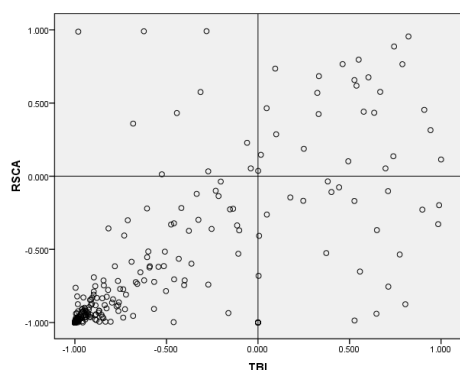| HS	Commodity Description
HS	*Commodity Description*
2922	Oxygen-function amino-compounds
2935	Sulphonamides
8430	Moving/grading/scraping/boring machinery for earth
8523	Prepared unrecordd media for sound record (tapes)
3902	Polymers of propylene or of other olefins, in primary forms
8475	Machine for assg elec/electrn lamp;mach for wrkg glassware
2902	Cyclic hydrocarbons
2713	Petroleum coke, petroleum bitumen & other residues of petroleum oils
2907	Phenols; phenol-alcohols
3901	Polymers of ethylene, in primary forms
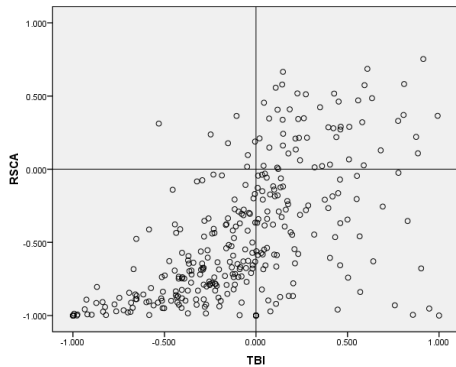
4.   Thailand

HS	Commodity Description
HS	*Commodity Description*
4001	Natural rubber,balata,gutta-percha etc
4007	Vulcanised rubber thread and cord
4015	Articles of apparel&clothing accessories of vulcanised rubber
4014	Hygienic/pharmaceutical art of vulcanised rubber
8415	Air conditioning machines, with motor-driven elements
2910	Epoxides, epoxyalcohols, epoxyphenols&epoxyethers&their derivatives
8450	Household or laundry-type washing machines

HS	Commodity Description
7103	Precious & semi-precious stone,not strug,
8522	Parts and accessories of video, magnetic recorder
4013	Inner tubes of rubber

5.	Philipines
HS	**Commodity Description**
1513	Coconut (copra),palm kernel/babassu oil & their fractions
4017	Hard rubber in all forms,including waste&scrap;articles of hard rubber
8470	Calculatg mach;accountg mach,cash register,ticket-issuing
8505	Electro-magnets;permanent magnets;magnetic chucks;etc
8541	Diodes/transistors&sim semiconductor devices; etc
8522	Parts and accessories of video, magnetic recorder
8544	Insulated wire/cable
8504	Electric transformer,static converter (for example rectifiers)
8471	Automatic data processing machines;optical reader, etc
1520	Glycerol (glycerine)

Source : UN COMTRADE Accessed from INTRACEN, author's calculation

Table 4 presents the products mapping for ASEAN-5 in 2016. The second colomn represent top-ten listed product in Group A for each ASEAN5 countries. These products considered as the best-ten products in their comparative advantage and positive trade balance (net-exporter). As we cansee above, Indonesia's exported commodities and comparative advantage mostly are from animal or vegetable fats and oil, Malaysia's mostly are from rubber and articles thereof, Singapore and Thailand's mostly from organic chemicals, and Philipines's mostly from electrical and electrical equipment.The higher the comparative advantage of a specific product, the higher the possibility of a country as a net exporter becomes (Widodo 2009).

Conclusions

This paper analyzed ASEAN-5's comparative advantage of their best ten products using "products mapping". As two from four key elements of ASEAN Economic Community which written on its Blueprint were a single market and production base (such as free flow of goods) and a competitive economic region, its a need to know which commodities are those countries in comparative advantage and as a net exporter. Using data retrieved from UN COMTRADE accessed from INTRACEN website, we used information of best ten ASEAN's leading export commodities

which was under 2 digits HS classsification. For analysis in this paper, we derived those products into 4 digits HS classification, so then we were not only use 10 commodities but 320 commodities. From the analysis, we got the result that , Indonesia's exported commodities (net-exporter) and comparative advantage mostly are from animal or vegetable fats and oil, Malaysia's mostly are from rubber and articles thereof, Singapore's mostly from organic chemicals, Thailand's mostly from rubber and articles thereof, and Philipines's mostly from animal or vegetable fats and oil.

REFERENCE

Akhtar, N., Zakir, N., and Ghani, E. 2008. Changing revealed comparative advantage : a case study of footwear indsutry of Pakistan. The Pakistan Development Review, 47(4), 695-709.

ASEAN Economic Blueprint. Retrieved from http:// www. asean. org/wpcontent/uploads / archive/5187-10.pdf BDG Asia. 2014. "Southeast Asia's Top Product Export Sectors (2013) ".Accessed 10thMay 2016. http://www.bdgasia.com/southeast-asias-topexport-sectors-2013/

Drysdale, P. and Garnautt, R. 1982. Trade intensities and the analysis of bilateral trade flows in a many country world : a survey. Hitotsubashi Journal of Economics, 22 (2), 62-84.

Kasahara, S. 2004. The flying geese paradigm : a critical study of its application to east asean regional development (UNCTAD Discussion Paper No. 169) = Retrieved from United Nations Conference on Trade and Development website http://unctad.org/en/docs/osgdp20043_en.pdf.

Kojima, K. 2000. The "flying geese" model of Asian economics development : origin,theoritical extensions, and regional policy implications. Journal of Asian Economics, 11 (4) , 375-401.

Laursen, K. 1998. Revealed comparative advantage and the alternatives as measures of international specialisation (DRUID Working Paper No. 9830). Retrieved from Danish Research Unit For Industrial Dynamics\ website http://www3.druid.dk/wp/19980030.pdf.

Ng, F. and Yeats, A. 2003. Major Trade trends in east asia, what are their implications for regional cooperation and growth? (Policy Research Working Paper No. 3084 .Retrieved from IDEAS website https://ideas.repec.org/r/wbk/wbrwps/3084.html

Nopirin. 2011. Ekonomi Internasional. Edisi 3. BPFE : Yogyakarta.

Sanidas, E. And Shin, Y. 2010. Comparison of revealed comparative advantage indices with Application to trade tendencies of east asian countries. Retrieved from www.akes.or.kr/eng/papers(2010) /24.full.pdf

Shohibul, A. 2013. Revealed comparative advantage measure : ASEAN-China trade flows. Journal of Economics and Sustainable Development, 4 (7), 136-145.

US Commercial Service. 2014. "Understanding the ASEAN Economic Community (AEC)– Frequently Asked Questions". Accessed 17 May 2016 http://export.gov/asean/build/groups/public/@eg_asean/documents/webc ntent/eg_asean_084987.pdf

Valle, P.A.M. and Aburqueque, M. A. 2009. The comparative advantage of some agribusiness products of the state of goiás and their pattern of trade flow to MERCOSUR: testing regional integration, for the period of 2000 to 2008. Retrieved from http://pendientedemigracion.ucm.es/info/ec/jec12/ archivos/A2ECONOMIA%20REGIONAL%20Y%20TERRITORIO/ORAL/ALBUQUERQ

UEMARQUES/ALBUQUERQUE-MARQUES.pdf Vollrath, T. L. 1991. A theoretical evaluation of alternative trade intensity measures of revealed comparative advantage. Weltwirtschaftliches Archiv, 127(2), 265-280.

Widodo, T. 2009. Comparative advantage : theory, empirical measures, and case studies.Review of Economic and Business Studies. 4, 57-82.

Wikipedia. "Masyarakat Ekonomi ASEAN". Accessed 15th May 2016.https://id.wikipedia.org/wiki/Masyarakat_Ekonomi_ASEAN

Williem. 2012. Keunggulan komparatif dan intensitas perdagangan ASEANMERCOSUR FTA. Skripsi: Fakultas Ekonomika dan Bisnis Universitas Gadjah Mada.

Yilmaz, B. 2003. Turkey's competitiveness in the european union: a comparison with five candidate countries - Bulgaria, the Czech Republic, Hungary,

Poland, Romania – and the EU15 (ezoneplus Working Paper No. 12) Retrieved from www.ezoneplus.org/.../ezoneplus_wp_twelve.pdf