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EMPIRICAL STUDY OF EXPORT COMPETITIVENESS OF AGRICULTURAL PRODUCTS IN ASEAN 3: REVEALED COMPARATIVE ADVANTAGE (RCA) APPROACH

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Abstract

Globalization in the economic field encourages the creation of free trade across countries, especially when the ASEAN Economic Community (MEA) is implemented. This condition poses opportunities and challenges for a country, especially a developing country. In an era of free trade increasingly lead to competitive competition between countries. Therefore, the writing of this paper aims to analyze how the export competitiveness of agricultural products in ASEAN 3, namely Indonesia, Philippines, and Thailand using Revealed Symmetric Comparative Advantage (RSCA) approach. The method of analysis in this study using descriptive analysis method to provide an image related to the competitiveness of export of agricultural products in ASEAN 3 and Relevead Comparative Advantages (RCA) Index. The Data in this paper used export of agricultural productn especially cocoa, cereals and maize in ASEAN 3 between 2001-2014 years. Based on the analysis, it is known that in facing the challenge of competition in the era of free market, the competitiveness of export of agricultural products still faces obstacles in competing in the market. This indicates the importance of policies directed to improve the competitiveness of agricultural products in a country. The role of government is very important in improving the productivity and quality of agricultural products in a country to enhance the competitiveness of exports in order to compete in the international market.

Keywords: Export, Competitivenes, Agricultural Product, Revealed Comparative Advantage (RCA), ASEAN 3.

INTRODUCTION

Economic development enters the era of globalization where there is openness of the economy and free trade between countries. This phenomenon indicates the need for the identification of competitive advantage, the potential of national economic capacity, the global market structure and the planning of a comprehensive program in enhancing market and product competitiveness. It also requires goal orientation in developing product competitiveness capacity.

The agricultural sector is an important sector in the economies of many countries [1]. This sector provides employment and is a mainstay of rural communities. According to data obtained in 2014, the agricultural sector provides as much as 32% of total employment in Indonesia. Similar circumstances also occur in Thailand and the Philippines, where the agricultural sector contributes 32% and 31% of total employment in both countries respectively [2]. Despite the decrease in agricultural employment uptake, the data above show that the agricultural sector in ASEAN 3 still plays a significant role in the national economy.

The performance of agricultural exports has always attracted the attention of policymakers because it is a source of foreign exchange income and improvements in agricultural income. The existence of ASEAN economic integration brings changes that indicate the need for domestic preparedness to face the global competition. One of the concerns facing ASEAN member countries is the ability of domestic agriculture to cope with the demands of new paradigms of international control and regulation.

Development of the agricultural sector remains a priority for ASEAN member countries. This can be seen from how big the allocation of the country's productive land use for the agricultural sector. Data obtained in 2013 shows that 32% of Indonesia's productive land is used for agricultural production. The same year also found 42% of Philippine productive land and 43% of Thai productive land dedicated to agriculture [2].

The explanation above illustrates the urgency of the agricultural sector, which still plays an important role in the economy of the ASEAN member countries. Agriculture is one of the key engine of ASEAN countries' economy growth, seeing that most of the countries strongly depend on this sector. Due to the fact that Southeast Asia has a dynamic geography, ASEAN has a variety range of food and agriculture with a number of ASEAN countries ranking as worldwide top exporters in products. Strong trade links in these products with countries across the globe have been established in many ASEAN member states. Furthermore, this research will focus on three priority commodities in agriculture in ASEAN 3, namely cocoa, maize, and cereals.

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Reason why this study will analyze specific competitiveness of cocoa commodity, is because world cocoa demand is rises 2 % per year [3]. In status quo, most of world cocoa demand is fulfilled by West African countries – Ivory Coast and Ghana – but the current situation there is not favorable. Experts and also West African government said that they are running out of land and facing harsh climate change issues. Not to mention the fragile political stability in those areas. With this two factors combined further create less suitable condition for cocoa growing. In the quest of searching for alternative cocoa producers, ASEAN 3 countries is well-suited to become potential source to meet the world cocoa rising of demand.

Second commodity is maize. Maize is among the four strategic commodities that receive special attention in the blueprint of the ASEAN Economic Community (AEC). The AEC's food blueprint aims to enhance maize security & sovereignty, besides, rice, soybeans and cassava in the ASEAN region. Beside that, from the previous research we know that in 2016, ASEAN 3 countries produce more than 56 % of total maize production in whole ASEAN [4]. This fact thus moves study to also analyze the competitiveness of maize commodity.

Third commodity to be analyzed in this study is cereals. According to FAO, cereals refer to crops harvested to dry grain only (wheat, barley, coarse grain, rye, oats, millets, sorghum, buckwheat, and cereals nes) [5]. There is a shift in food trends in ASEAN 3 as a form of food diversification in addition to rice. Cereals become a food alternative for people in ASEAN 3.

Previous research has discussed the importance of the agricultural sector as in the research Ostadi, et al show that the one of the important sectors, which have a significant role in the development of export of country's industry, is the agricultural sector. Hui and Yin in 2011 gave recommendations on adjusting and optimizing the export structures, enhancing awareness, improving quality, strengthening inspection and so on [6]. Oji-Okoro employed multiple regression analysis to examine the contribution of agricultural sector on the Nigerian economic development [7]. They found that a positive relationship between Gross Domestic Product (GDP) vis-à-vis domestic savings, government expenditure on agriculture and foreign direct investment between the periods of 1986 to 2007. It was also revealed in the study that 81% of the variation in GDP could be explained by domestic savings, government expenditure and foreign direct investment. Olajide, et al analyses the relationship between agricultural resources and economic growth in Nigeria [8]. The ordinary least square regression method was used to analyze the data. The results revealed a positive cause and effect relationship between Gross Domestic Product (GDP) and agricultural output in Nigeria.

In the new paradigm circle of ASEAN community cooperation produce the economic impact of free trade between countries. This creates increasingly tight competition between countries. Agricultural commodities have an important role because most of the world's people are heavily dependent on agriculture, namely cocoa, maize, and cereals. Comparative advantage in this three agricultural commodities is considered important to provide a better picture of the ASEAN trade framework. Therefore, this study is designed to analyze the competitiveness of cocoa, maize, and cereals commodity trading in three ASEAN countries.

METHODS.

The data used in this study is secondary data from International Trade Center. Data used from 2001-2016. Research subjects were Indonesia, Philippines and Thailand. The complementary trade structure is necessary for mutual benefit. The RCA method is used to analyze the competitiveness of agricultural products especially cocoa, maize, and cereals between Indonesia, the Philippines, Thailand. This approach is modified in international trade to study the competitiveness of member countries and to explore the possibility of increasing cross-border trade cooperation.

The RCA index is used to capture the level of trade specialization of state. This index shows how a product competes in the export market. Products with high RCA competitiveness can be exported to countries with low RCA. The RCA formula can be written as follows:

$$RCA_1 = \frac{\left(\frac{Xij}{Xit}\right)}{\left(\frac{Xnj}{Xnt}\right)}$$

Where:
Xij = i^{th} country's exports of agricultural products j
Xit = i^{th} country's total exports of agricultural products (all commodity)
Xnj = n^{th} set of countries export of agricultural products J.
Xnt = n^{th} set of countries total exports of agricultural products (all commodity)

RCA index value ranges between zero (0) and positive infinitive (+ ∞). If the RCA index value of a country is greater than one, then the country has a comparative advantage in the product. But in this model there is still problem of asymmetry, therefore to eliminate this problem in this study using the model Revealed Symmetric Comparative Advantage (RSCA).

$$RSCA=(RSCA-1)/(RSCA+1)$$

The RSCA values range from (-1) and (+1) and are free from skewness problems. A commodity is said to have a comparative advantage on exports if the value of RSCA is postitive. The analysis using RSCA aims to look at the comparative advantages of agricultural products in each country.

FINDINGS AND ARGUMENT

Export are considered as one of the priorities of government to boost economic development and to face liberalization in International trade especially ASEAN Economic Community (AEC). The increasing of exports is one of the most fundamental indicator for increasing competitiveness in the economy. Increasing numbers of investor on agricultural is another important indicator for competitiveness. Moreover, increasing in the agricultural sector is very important because it will drive economic growth and reducing unemployment rate.

To examine the export competitiveness of agricultural products of cocoa, cereals and maize among Indonesia (ID), Philippiness (PH) and Thailand (TH), we used the RSCA Index. To capture the degree of trade specialization of 3 country using RCA Index. It shows how a product is competitive in country's exports compared to the product's share in another country or group countries. A product with high RSCA value is competitive enough and can be exported to countries with low RSCA Value. Countries with similar RSCA profile are likely to have high bilateral trade intensity unless intra-industry trade is involved [9]. Sinoj and Mathur explain that the assumption that the commodity pattern of trade reflects the inter-country differences in relative cost as well as non-price factors, the index is assumed to "reveal the comparative advantage of the trading countries [10]. The advantage of using the RSCA index is that it considers the intrinsic advantage of a particular export commodity and is consistent with the changes in an economy's relative factor endowments and productivity. Batra and Khan also explaind about the disadvantage., however, is that it cannot distinguish improvements in factor endowments and pursuit of appropriate trade policies by a country [11]. The analysis of RSCA value for analys of competitive export commodities arepresented in table 1.

Table 1. RSCA Value of Cocoa Export

Years	RSCA Export ID to PH	RSCA Export ID to TH	RSCA Export PH to ID	RSCA Export PH to TH	RSCA Export TH to PH	RSCA Export TH to ID)
2001	0.87	0.99	-0.87	0.93	-0.93	-0.99
2002	0.76	0.99	-0.76	0.98	-0.98	-0.99
2003	0.85	0.94	-0.85	0.97	-0.97	-0.94
2004	0.89	0.86	-0.89	0.96	-0.96	-0.86
2005	0.92	0.95	-0.92	0.94	-0.94	-0.95
2006	0.87	0.94	-0.87	0.98	-0.98	-0.94
2007	0.76	0.99	-0.76	0.95	-0.96	-0.99
2008	-1	0.99	-1	0.94	-0.94	-0.99
2009	0.99	0.99	-0.99	0.94	-0.94	-0.99
2010	-1	-1	-1	0.77	-0.77	-1
2011	0.97	-1	-0.97	0.38	-0.39	-1
2012	0.99	0.99	-0.99	0.8	-0.8	-1
2013	0.76	0.99	-0.76	0.82	-0.82	-0.99
2014	0.98	0.96	-0.98	0.71	-0.71	-0.96

Source: Author's calculation based on FAOSTAT,

According to the World Cocoa Foundation said that the increase in global demand for cocoa increased by 3% per year. It is estimated that global demand for cocoa will increase for the coming years. Based on the results of RSCA analysis shows that Indonesia has a greater comparative advantage compared to Philippiness and Thailand. The increasing demand for cocoa globally is very beneficial for Indonesia. This is because Indonesia is one of the largest cocoa producers and exporters [12].

However, in developing its production, Indonesia is experiencing difficulties because most of the cocoa production is obtained from small farmers who have constraints on access to capital to optimize the production of cocoa both in terms of quality and quantity. In addition, land shifts in the palm oil and rubber industries that are considered more promising cause farmers to shift their focus of production. Another challenge is the value added of cocoa in Indonesia's export because the majority of the exported cocoa production is still in the form of raw cocoa beans. Therefore, the government has an important role in stimulating the processing industry to have value-added. Based on the analysis shows that Thailand's cocoa export commodity does not have comparative advantage. This indicates that the export value of cocoa products in Thailand is low. This condition is due to Thailand considered cocoa as less strategic export product. That is why Thai's cocoa has a low export value.

However, this commodity has an opportunity to develop because the allocation of the productive land for agriculture in Thailand is about 43%.

Table 2. RSCA Value of Cereals Export

Years	RSCA Export ID to PH	RSCA Export ID to TH	RSCA Export PH to ID	RSCA Export PH to TH	RSCA Export TH to PH	RSCA Export TH and ID
2001	0,000563	0	0,998875	1	0,854007	-1
2002	0,002043	0	0,995923	1	0,289195	-1
2003	0,015625	0,00708	0,969232	1	0,174167	0,985939
2004	0,034551	0,002059	0,933206	1	0,175205	0,995891
2005	0,067597	0	0,873367	0,999999	0,237254	-1
2006	0,034231	0	0,933805	0,999999	0,295079	-1
2007	0,05246	0,001412	0,90031	1	0,24329	0,997181
2008	0,165339	0	0,716239	0,999999	0,75585	-1
2009	0,360466	0,242686	0,470084	0,999997	0,907193	0,609417
2010	0,909775	0,463194	0,047244	0,999983	1,760265	0,366873
2011	0,986548	0,643234	0,006772	0,999981	1,869429	0,217112
2012	0,709028	0,141692	0,170256	0,999992	0,691803	0,751785
2013	1,551151	0,276081	-0,21604	0,999993	0,891535	0,567298

Source: Author's calculation based on FAOSTAT

The RSCA Index calculation in this case is used to see the comparative advantage of cereals products between Indonesia, the Philippines and Thailand. Using the RSCA index can be known in 2013, RSCA Indonesia's exports to the Philippines have the highest value with a value of 1.55. This shows the export of Indonesian cereal products that have a strong competitive advantage. These results prove Indonesia is the upper hand in the terms of cereals production, compared with Philippiness and Thailand which has a lower RCA index. Food consumption is turn into a lifestyle not merely an activity to fulfill human basic needs.

The increasing popularity of Western culture in Indonesia as well as healthy lifestyles support the growth demand of a healthy staple commodities like for example cereal products. Consumers believe, higher prices, more benefits. This is one of the pairs behind the comparative product of cereal products in Indonesia. While in Thailand, by 2016, more Thais are present as the most important. Coupled with the busy lifestyles of people who need an easy solution for breakfast. In addition, the demand for healthier products, the demand for top-level breakfast cereals among the local population. The high demand for cereal consumption as an alternative to esteran 4% breakfast growth in 2016 for breakfast is higher than in 2015 [13]. In Philippiness breakfast cereals have plenty of room for expansion, lunch before lunch, waiting for Filipino preference to eat rice or grilled food for breakfast. By 2016, breakfast cereals grew by 7% and retail volume growth by 4%, sharing with performance in 2015. This is because breakfast cereals benefit from opportunities for a customer base supported by a growing desire among consumers to make healthy food choices This will continue to be in demand because of its famous fiber content. Increased consumer desire for convenience also helps sales growth because breakfast cereals are easier to prepare than rice foods.

Table 3. RSCA value of Maize Export

Years	RSCA Export ID to PH	RSCA Export ID to TH	RSCA Export PH to ID	RSCA Export PH to TH	RSCA Export TH to PH	RSCA Export TH and ID
2001	0,14354	0,033865	0,748956	0,99996	0,929893	0,934488
2002	0,315157	0,004667	0,520731	0,999445	0,997727	0,990709
2003	0,87276	0	0,067943	0,999477	0,996715	-1
2004	0,998445	0,070048	0,000778	0,999899	0,918758	0,869074
2005	0,963654	0	0,01851	-1	-1	-1
2006	0,989321	0	0,005368	0,999993	0,546679	-1
2007	0,998748	0,000492	0,000627	0,999965	0,850271	0,999017
2008	0,911965	0,041978	0,046044	-1	-1	0,919426
2009	0,683312	0,054722	0,188134	0,999953	0,960354	0,896235
2010	-1	0,789425	0	0,99986	0,995081	0,117678
2011	0,994551	0,156072	0,002732	0,998792	0,999649	0,729995
2012	0,998636	0,493673	0,000682	-1	-1	0,338981
2013	0,621911	0,042654	0,233114	-1	-1	0,918182

Source: Author's calculation based on FAOSTAT.

Maize is among the four strategic commodities that receive special attention in the blueprint of the ASEAN Economic Community (AEC). The AEC's food blueprint aims to enhance food security & sovereignty of maize,

rice, soybeans and cassava in the ASEAN region. From the analysis we can know that Indonesia's maize export commodities have comparative advantage, which is indicated by the significant export value of Indonesian maize. Maize is widely grown in Indonesia, with the need for water that is not too much as other food commodities. This is consistent with the weather character – especially in parts of Eastern Indonesia – where access to irrigation water is often constrained by prolonged drought. Endurability of maize against pests is also quite high when compared to other commodities. That is why Indonesia's maize commodities have a good comparative advantage. In the future, Indonesian government can increase the comparative advantage of maize commodities by providing counselings and extension of access to subsidized fertilizer to farmers.

As for the Philippines, comparative advantage analysis of maize commodities shows less favorable results. The maize commodity has no comparative advantage, which is known based on the value of Philippine maize exports to Indonesia and Thailand. There is a decrease in production caused by agricultural management systems that are less supportive of farmers to grow maize. In addition to the non-encouraging farming system to produce more maize, unfavorable weather and pest outbreaks [4] also play a role in the low acquisition of RSCA value maize Philippines in 2005 to 2013. In order for the maize commodity to become a profitable commodity, the Philippines government must reform the rules and systems so that farmers will be incentivized when producing maize. Scientific efforts to cope with pests and plant modifications to enhance resilience maize also need to be improved.

A comparative advantage analysis of Thai maize commodities shows that maize is a competitive and profitable commodity in Thailand's export trade to Indonesia and the Philippines. The results of the analysis show that Thai maize commodities are constantly in good value, always above 0.5 points - except for a few years such as 2005 and 2012, caused by crop failure from flood that hit Thailand's agricultural production base [4]. The Thai government can improve irrigation infrastructure such as dams, reservoirs and canals to minimize the possibility of river water overflow. Community participation in early warning systems can increase awareness and, in turn, reduce food production losses caused by floods.

CONCLUSION

Agriculture and agribusiness globally are undergoing far-reaching changes. Agribusiness not only needs to compete in their domestic market, but also to compete in overseas markets and develop strategies to encourage new customers in new markets to buy their products. Competitiveness and competitiveness issues are important for agribusiness managers and governments. Competitiveness can be evaluated at various economic levels: at the level of the country's product, company, industry and economy. In our research, we focus on the competitiveness analysis of ASEAN 3 agricultural products (Indonesia, Philippines and Thailand). We use numerical calculations using the RCA index (Comparative Advantage Index). The comparative advantage index is the index used in the international economy calculating the relative gain or loss of a particular country in a particular group of goods or services. Calculations show that the export competitiveness on agricultural product namely cocoa, cereals and maize more competitive than another countrys especially Philippiness and Thailand.

This study recommends policy options to improve the performance of these value chains in the future, both in terms of competitiveness and sustainability. Government should strengthening competitiveness and sustainability of the cocoa, cereals and maize commodities with covering the inclusiveness of smallholder farmers and small scale processors of respected agricultural commodities.

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