

## Regional market integration, Covid-19, and agricultural trade performance in Southeast Asia

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### Abstract

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Regional Market Integrations (RMIs) are becoming increasingly popular globally, especially in Asia. RMIs have many advantages for the participants. However, RMIs improve inter-country dependency and are vulnerable to external shocks. The Covid-19 pandemic is now disrupting human life, including agricultural trade between countries. This situation encouraged us to compare RMIs' positive impact with Covid-19's negative impact. This study investigates the impact of RMI and Covid-19 pandemic on SEA's agricultural trade and measures its competitiveness corresponding to them. The sample of this study is the SEA region which is among the world's highest-growing RMIs. We employed secondary data derived from ASEANStats for 2012-2020 periods on HS01-HS24 commodities. General short-term export-import patterns, Revealed Comparative Advantage, and Trade Specialization Index were used to denote trade performance. We present evidence that the ASEAN Economic Community, which represents RMIs, generally increases agricultural commodity trading patterns and competitiveness. However, the benefits generated by the RMI were undermined by the Covid-19 pandemic which had a tremendous impact on the trade performance of ASEAN countries. In order to accelerate RMI and ease the negative impact of Covid-19, we recommend three strategies in the form of capacity building, technology implementation, and improvement of the market situation.

*Keywords:* ASEAN Economic Community; Covid-19; agricultural trade; competitiveness

### Introduction

Asia is currently the world's largest trading area. In 2017, Asia's share of global exports and imports was 38% and 31%. During 2002-2017, each Asian country's exports and imports averaged 26% and 23% of their GDP. The growing number of Regional Market Integrations (RMIs) in this area is one reason for this condition. The RMIs' benefits were shown by the intra-regional share of overall Asian products trade from 50% in 1990 to 60% in 2017 (Gopalan et al., 2020).

There are several policies carried out at RMIs, including complete elimination of the tariffs, reduce trade (or trade facilitation) costs, labor market reform, decrease in barriers against foreign direct investment (FDI), use a single currency, deregulation, and wage restraint (Arestis & Phelps, 2018; Balistreri & Tarr, 2020; Umulisa, 2020). Then, RMIs give some benefits, including increases trade among partner countries, growths of a sector, increases productivity gains, develops value chains, makes a significant contribution to connectivity and mobility, reduces unemployment rates, increases real wages, reduces inequality, increases in factor

incomes and consumer welfare, enhances industrial development and investment, and improves cooperation on infrastructure development (Arestis & Phelps, 2018; Ben Romdhane et al., 2013; Black et al., 2021; Chakraborty & Kumar, 2012; Hearn & Piesse, 2020; Q. Li et al., 2016, 2016; Ma et al., 2021).

Even though it seems to provide many benefits, it turns out that the RMIs have several issues such as benefits centered in favor of larger economy countries at the detriment of smaller countries, the obscurity of sharing welfare gains (or losses), trade models which do not promote intra-trade, non-tariff and institutional barriers, poor of political commitment to enforce trade agreements, and political instability in certain economic regions (Blecker, 2014; Jensen et al., 2012; Pasara & Diko, 2020; Rao, 2012). As a result, the RMIs do not perform optimally in certain regions. For example, the African Continental Free Trade Area (AfCFTA) contributes only a limited amount to cereals and food security in Africa (Pasara & Diko, 2020). This condition also happened in advanced RMIs such as the European Union (EU). Divisions and confrontation within the EU on trade and investment have led to Brexit (Maier & Pitaraki, 2016). These issues also occur in Asia, indicating that the RMIs in this continent are not as powerful as it seems (Rahman & Jahan, 2015; Wu, 2020). Moreover, RMIs are very vulnerable to global shocks (Park & Lee, 2011).

Nowadays, the global economy has suffered as a result of the Covid-19 pandemic. Overall, the Covid-19 pandemic harmed lives and livelihoods worldwide (Gupta et al., 2021). Many factories, offices, and shops were closed, and people's movement was restricted. Around the same time, economic growth and GDP in many countries are slowing down; poverty, unemployment, fiscal deficit, and monetary burden are increasing; world oil prices have fallen; and there were severe global economic crises and recession (Gerwe, 2021; Jena et al., 2021; Rasul et al., 2021; Raza Rabbani et al., 2021; Razumovskaia et al., 2020; Štifanić et al., 2020). Meanwhile, there was an increase in price and poor performance in the stock market, and high volatility of country's stock returns (Kusumahadi & Permana, 2021; Machmuddah et al., 2020; Nurhayati et al., 2021). At the same time, there was an increase in social discrimination (Narayanan & Saha, 2021). For example, women are more likely to lose their jobs and incomes than men (Dang & Viet Nguyen, 2021). This pandemic also has effects on agriculture, such as changes in planting area and crop productivity, decreases total agricultural production and GDP, lowered farm-gate product prices, increases production costs, causes farmers to lose a lot of profits, increases emphasis on local products, difficulties of moving agricultural products within the supply chains,

worker shortages, lack of operating capital, and heightened food insecurity (Gupta et al., 2021; P. K. Jha et al., 2021; McBurney et al., 2021; Wang et al., 2020).

Based on the previous explanation, we are interested in investigating the impact of the RMIs and Covid-19 on trade performance and competitiveness. To accomplish this aim, we chose the Southeast Asian (SEA) region as the study's sample, based on arguments: First, from 2002 to 2017, the economies of SEA countries expanded exponentially. During this period, these countries increased their share of global output from around 2% to over 3.5 percent (Gopalan et al., 2020). But, the Covid-19 outbreaks may have disrupted this achievement. Second, the emergence of various new industrial countries around the SEA region, especially China and India. SEA countries are becoming an essential destination for their exports. China's contribution to global output increased from about 4% in 2002 to 15% in 2017. Between 2002 and 2017, India's share of global GDP doubled, from around 1.5 percent to 3 percent (Gopalan et al., 2020). China and India can produce more competitive products than those produced by SEA countries. Their governments also provide many supports for their industries (Banik & Kim, 2020; Chakraborty & Kumar, 2012). As a result, it could become a threat to intra-regional trade in the SEA region.

Third, a lot of Asian Free Trade Agreements (FTAs) involving SEA countries. At least one ASEAN or East Asian economy is involved in nearly 67% of the 62 Asian FTAs currently being negotiated (Gopalan et al., 2020). As a result, the SEA region is much integrated and globalized compared to other Asian regions. This area is very active in world trade, as indicated by the ownership of 16% of the world's largest container ports with very high traffic levels (Korwatanasakul, 2020; Lissovolik, 2017). Fourth, the tendency of RMI among SEA countries can still be optimized. It's because they face significant challenges due to their diversity and various levels of growth (Petri et al., 2012). They are also more open to trade and invest with countries outside ASEAN partners and carry out inconsistent strategies and policies to jeopardize the RMI process (Jha et al., 2010; Pimoljinda & Siriprasertchok, 2018). Even though Chakraborty and Kumar (2012) and Utama (2021) have made a simulation, ASEAN members will improve their bilateral trade in products if they are remoteness from the rest of the world trade. However, SEA countries are also facing multilateral trade liberalization. To reduce stumbling blocks to the WTO trading system, they must directly participate in the multilateral trade agreement, such as region-to-region in the Asia-Pacific and Latin America (Utama, 2021).

The next step is selecting the sector that will be the focus of our study. This process must be done because of the many economic sectors in the SEA and the various limitations. Finally, we will focus on agriculture because it is the primary source of income in SEA countries (Jha et al., 2010). Also, agriculture is still the most challenging sector to negotiate on international trade agreements, has weak competitiveness, and often faces market distortions that impede economic diversification into higher-value-added activities (Draper et al., 2013; Kuznetsova, 2013). The study will be more interesting because agricultural trade faces challenges in reviving economic nationalism in a country to increase support for national producers (Nadiia et al., 2020).

That way, specifically, this study aims to investigate the impact of RMI and Covid-19 pandemic on SEA's agricultural trade and to measure its competitiveness corresponding to them. This study provides a better overview for RMIs, especially in SEA, to deal with external shocks to its agriculture in the future. We also hope that RMI in SEA countries will improve. This can be the only realistic solution for breaking the deadlock in multilateral negotiations (Adlung, 2020; Jha et al., 2010). This study also gives economists a perspective on non-economic, social, and political external shocks on RMI theory.

## Material and Methods

We used secondary data from ASEAN Statistics Division (ASEANstats) database to achieve the study's aims, including the volume and value of export-import. The export-import data used in the study are the total trade value (all commodities: HS Code 00) and commodities produced by the agricultural sector with the two-digit HS Code 01-24 trading code. The sample countries in this study are Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Viet Nam. Commodity details are shown in Appendix 1.

The data from 2012 to 2020 was used to visualize short-term trading patterns. The data were grouped into 4 periods based on the timeframe: (1) 2012-2014 as the period before the AEC's implementation; (2) 2015-2019 as the AEC's implementation; (3) 2020 as the Covid-19 period; and (4) 2015-2020 as the AEC's implementation plus Covid-19 period. The division of this period will be used to assess the short-term impact of AEC and the Covid-19 pandemic on agricultural trade performance.

We use graphical analysis to visualize the progress of SEA agricultural export and import performance. The period division presented in the previous sub-section can overview international trade patterns, particularly in the agricultural

and food sector commodities. Visualization of the growth of export-import performance will show the general conditions of various indicators in each period. This step is beneficial in determining the short-term impact of market integration through the AEC Agreement and the Covid-19 pandemic on agricultural commodity trade in the SEA region.

Competitiveness will be represented by a scale and level represented by the Revealed Comparative Advantage (RCA) index and the Trade Specialization Index (TSI). The fundamental issue regarding the impact of Covid-19 on SEA trade performance is how competitiveness responds to pandemic phenomena. Many kinds of literature suggest various methods for determining the level of competitiveness in cross-border trade. This study accommodates the Ricardian trade model presented by the nineteenth-century economist David Ricardo. This model illustrates how country's level of technology affects the wages paid to workers, with higher wages in countries because of advanced technology. The Ricardian model also explains how a country's technology influences its trade patterns (Freenstra & Taylor, 2017).

Bela Balassa was one of the Hungarian economists who used 1951 data to validate this model. The data used are the ratio of the United States to British exports in 1951 with the ratio of the United States to British labor productivity for 26 manufacturing industries. The Balassa index of the Revealed Comparative Advantage (RCA) method was born due to this (Krugman & Obstfeld, 2003; Salvatore, 2013).

The trade performance of individual countries can indicate RCA in terms of manufactured products. The trade product trend reflects relative costs and variations in non-price factors. For one side, the comparative advantage would be required to determine the export structure; for another side, export-import ratios would represent relative advantages under the presumption of taste uniformity and a regular occurrence of duties in each country's industry. While statistical commodity groups' heterogeneity allows for exports and imports to occur under the same grouping, the greater a country's advantage in manufacturing the products in question, then a country would achieve the higher the ratio of the fob value of exports to imports (Balassa, 1965). RCA can also calculate the revealed competitive advantage on the share of the type of goods or services in a particular country's exports and global exports to a specific (Deardorff, 2011).

In the RCA model, individual industries' export performance in a particular country can be assessed by (a) comparing a country's relative shares in world exports of individual commodities and (b) showing changes in relative shares over time. The specifications for the RCA method are as follows (Balassa, 1965):

$$\frac{X_{ij}^0}{X_{nj}^0} / \frac{X_{it}^0}{X_{nt}^0} = \frac{x_{ij}^0}{x_i^0} \quad (1)$$

$$\frac{X_{ij}^1}{X_{nj}^1} / \frac{X_{it}^1}{X_{nt}^1} = \frac{x_{ij}^1}{x_i^1} \quad (2)$$

$$\frac{x_{ij}^1}{x_i^1} / \frac{x_{ij}^0}{x_i^0}, \quad (3)$$

where: (1) the relative share of country  $i$ 's exports of commodity  $j$  in the first period; (2) the relative share of country  $i$ 's exports of commodity  $j$  in the second period; and (3) the ratio of the relative share of country  $i$ 's exports of commodity  $j$  in the second period to that in the first period.

Explanation of symbols:  $X$  = exports,  $x$  = relative share of exports. 0 = average for the first period, 1 = average for the second period,  $i$  = country  $i$ ,  $n$  = aggregate countries taken together,  $j$  = product  $j$ , and  $t$  = total products.

Then, the formula has been used in this study (Balassa, 1978):

$$RCA_{ij} = \left( \frac{X_{ij}}{X_{it}} \right) / \left( \frac{X_{ej}}{X_{et}} \right), \quad (4)$$

where:  $X_{ij}$  = the current year's total value of agricultural exports HS01-HS24 of a country to SEA region (US Dollars),  $X_{it}$  = the current year's total value exports of a country to SEA region (US Dollars),  $X_{ej}$  = the current year's total value of agricultural exports HS01-HS24 of all SEA countries to SEA region (US Dollars), and  $X_{et}$  = the current year's total value exports of all SEA countries to SEA region (US Dollars). The results obtained from the formula are: 1) a country has a comparative advantage if the index generated from the RCA calculation is more than 1, and 2) a country has a comparative disadvantage if the RCA value is less than 1.

Furthermore, the Balassa version of the RCA index can be transformed to show a constant average in specific commodity sectors in each SEA country. Proudman and Redding (2000) has proposed this transformation of trade specialization index (TSI). Implicitly, this index considers both the demand and supply sides, where exports are identical to domestic supply and imports are domestic demand. According to the international trade theory, this is called the theory of net surplus. The products are exported as there is an excess in the domestic market. According to this postulate, we used the modified calculation formula for the TSI is notated as follows (Iapadre, 2001):

$$TSI_{ij} = \frac{X_{ij} - M_{ij}}{X_{ij} + M_{ij}}, \quad (5)$$

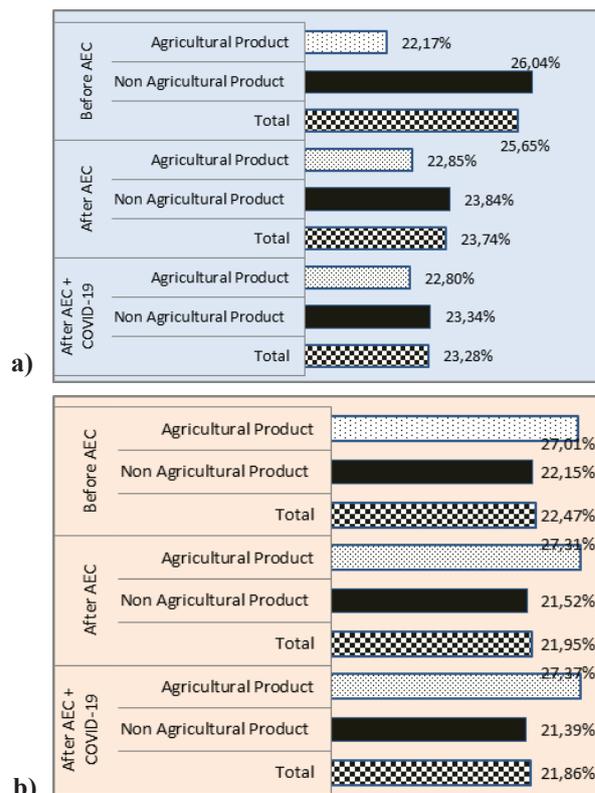
where:  $X_{ij}$  = export value of the HS01-HS24 commodity from each SEA country (US Dollars),  $M_{ij}$  = import value of

the HS01-HS24 commodity from each SEA country (US Dollars). The TSI can also be used to identify the growth rate of a commodity in trade which is divided into 5 stages: (1) Introduction, if the TSI value is -1 to -0.5; (2) Import substitution, if the TSI value is -0.5 to 0; (3) Growth, if the TSI value is 0.01 to 0.8; (4) Maturity, if the TSI is 0.81 to 1; (5) Re-importing, if the TSI has decreased from the range 1 to 0.

## Results

### *Agricultural Export-import Performance under AEC Agreement and Covid-19 Pandemic*

Trade transactions are expected to increase in the intra-ASEAN market following the AEC's implementation, which further encourages RMI in ASEAN. Figure 1 shows the proportion of trade in agricultural and non-agricultural products in the intra-ASEAN market in each period. Before the AEC's implementation, the export of agricultural products in the intra-ASEAN market was 22.17% of the total export value of this type of product, implying that 77.83%



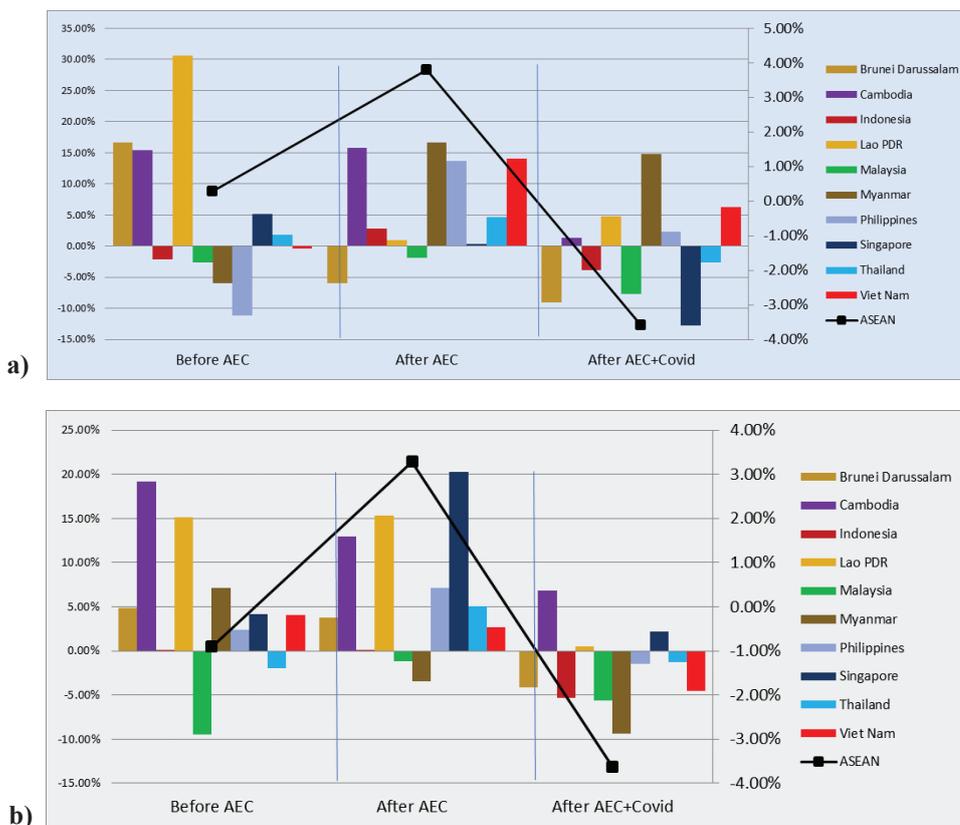
**Fig. 1. (a) Intra-ASEAN export share by product groups; (b) Intra-ASEAN import share by product group**

of other agricultural products were exported outside ASEAN. Similarly, almost all non-agricultural products were purchased by countries outside the SEA region, and only 26.04% went to fellow SEA countries. On the import side, before the AEC's implementation, imports were dominated by countries outside the SEA region.

The proportion of agricultural commodity export and import transactions in the intra-ASEAN market has increased, but not significantly, with an increase of less than 1%. In the timeframe following the AEC's implementation, the share of agricultural commodity exports in the intra-ASEAN market accounted for 22.85%. Meanwhile, the share of imports in the same market accounted for 27.31%. After the Covid-19 pandemic, agricultural commodity exports in the intra-ASEAN market decreased slightly to 22.80%. Meanwhile, the share of agricultural commodity imports from the intra-ASEAN market rose slightly to 27.37%. According to this information, the share of transactions in the intra-ASEAN market tends to be minor, below 30%. This situation demonstrates that the role of the intra-ASEAN market has not yet dominated the trade trans-

actions of ASEAN countries, particularly in agricultural commodities.

According to the findings of this previous study, the Covid-19 pandemic has seriously harmed agricultural commodity export performance in SEA countries. The average value of export growth for SEA agricultural commodities has fallen dramatically by more than 10% in intra-ASEAN and extra-ASEAN markets. This condition is inversely proportional to the period after the AEC's implementation and before the Covid-19 pandemic, where agricultural commodity exports to the two destination markets increased significantly, by an average of more than 20%. This performance is much better when the AEC was not yet implemented (Figure 2). Several countries, including Cambodia, Lao PDR, Myanmar, the Philippines, and Vietnam, have succeeded in maintaining the export performance of agricultural commodities in the intra-ASEAN market. Meanwhile, in the extra markets of ASEAN, Cambodia, Lao PDR, and Singapore have the ratio to record export growth. Even though Singapore is not a producer of agricultural commodities, this country can still boost re-export activity for this commodity.



**Fig. 2. (a) Intra-ASEAN average export growth of agricultural products; (b) Extra-ASEAN average export growth of agricultural products**

Shrinking performance has also spread to agricultural commodity import activities both in the intra-ASEAN and extra-ASEAN markets. In aggregate, import growth shrank in the period following the Covid-19 pandemic. The import activity of SEA agricultural commodities increased when the AEC was first implemented. The decline in the rate of imports indicates a slowdown in ASEAN's transactions as a unit. However, some countries have increased agricultural commodity imports after the Covid-19 outbreak. In the intra-ASEAN market, Cambodia, Lao PDR, the Philippines, and Thailand tend to increase imports. Meanwhile, imports of agricultural commodities from the extra-ASEAN markets of Cambodia, Lao PDR and Viet Nam increased during the pandemic (Figure 3).

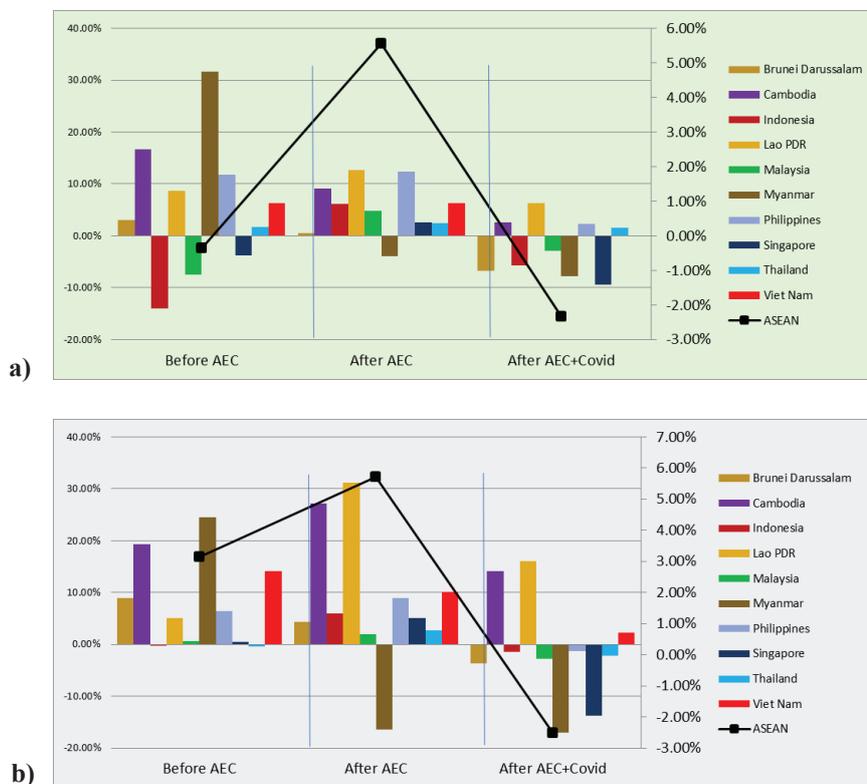
#### *Agricultural Trade Competitiveness Corresponds to RMI and Covid-19*

The RCA index represents ASEAN countries' competitiveness in agricultural commodity trade. The RCA analysis in this study is classified into three periods to capture the development of competitiveness in three different eras. This

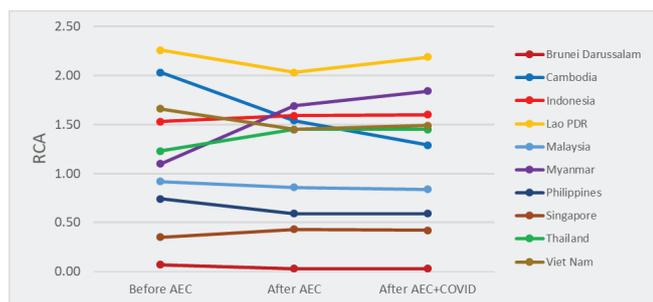
step is beneficial in determining the impact of AEC and the Covid-19 pandemic on each country's competitiveness.

Before the AEC's implementation, Lao PDR had the highest RCA value, indicating that it was the most competitive among other SEA countries. Meanwhile, Brunei Darussalam had the lowest RCA. After the AEC's implementation, Lao PDR was still the most competitive country. If observed further, it can be shown that some countries' RCA values changed since the AEC was implemented. The RCA value increased in Myanmar, Thailand, Viet Nam, Singapore and Indonesia. Meanwhile, other countries experienced a decrease in the RCA value.

After the outbreak of the Covid-19 pandemic, many countries' competitiveness changed. Lao PDR remains consistently the highest and has increased the RCA value. Myanmar has seen a rise in its RCA value as well. On the other hand, Malaysia and Cambodia experienced a significant drop in RCA values. Other countries, Indonesia, Brunei Darussalam, the Philippines, Singapore, and Thailand experienced relatively little change after the Covid-19 pandemic (Figure 4).



**Fig. 3. (a) Intra-ASEAN average import growth of agricultural products; (b) Extra-ASEAN average import growth of agricultural products**



**Fig. 4. RCA of agricultural product trade in the SEA countries**

The TSI value represents agricultural product development and the dependence on imported agricultural products in each SEA country. Figure 5 shows the position of each SEA country’s agricultural product development in the global market. Before the AEC’s implementation, Indonesia, Thailand, Lao PDR, Malaysia, Singapore, and Viet Nam were in the “growth” category, meaning they carried out large-scale production and increased their exports. This happens because of the excess supply of agricultural products in the domestic market. Myanmar was still going through an “import substitution” phase at the time, which meant that its competitiveness was very poor since its production volume was not high enough to reach economies of scale. This position also indicates that Myanmar exports low-quality agricultural products. Its domestic production is still smaller than its demand. In other words, Myanmar already imports more than its exports. During the same period, Brunei Darussalam, the Philippines, and Cambodia were the three countries with the lowest position - “introduction.” This means that these three countries are heavily reliant on agricultural imports to meet their demand.

After the AEC’s implementation, there was a shift in agricultural product development, namely in Lao PDR and Viet Nam. Both countries experienced a decline in status as they moved from “growth” to “import substitution.” This shows the two countries’ declining ability to fulfill domestic needs individually and the penetration of agricultural commodity exports. Meanwhile, eight other countries are still in the same position before the AEC’s implementation. The TSI status of all SEA countries has not changed since the Covid-19 pandemic.

**Discussion**

The agricultural exports are vital for all economies in SEA countries (Kijboonchoo et al., 2018; Vogiatzoglou, 2019). They are an essential player in global agribusiness. However, they have poor value chain conditions, especially in technology, innovation, supply chain, policymaking, distribution, packaging, and new product development (Adekunle et al., 2018). We show in this study that the performance of agricultural trade in SEA countries is not optimal due to these various problems.

Before the AEC’s implementation, intra-ASEAN agricultural export growth was negative in Indonesia, Malaysia, Myanmar, the Philippines, and Vietnam. On the import side, Indonesia, Malaysia and Singapore are countries with negative intra-ASEAN agricultural import growth. Various trade barriers appear to be the leading cause of negative export-import growth among SEA countries. Feridhanusetyawan & Pangestu (2003) stated that SEA countries still impose tariff barriers on trade in some agricultural products. Another reason is SEA countries conduct more agricultural trade with countries outside of ASEAN. Figures 2b and 3b show that

Category (TSI range)	Before AEC	After AEC	After AEC + COVID-19
<b>Maturity</b> (TSI = 0.81 to 1)			
<b>Growth</b> (TSI = 0.01 to 0.80)	<ul style="list-style-type: none"> <li>Indonesia</li> <li>Thailand</li> <li>Singapore</li> </ul>	<ul style="list-style-type: none"> <li>Indonesia</li> <li>Thailand</li> <li>Singapore</li> <li>Malaysia</li> </ul>	<ul style="list-style-type: none"> <li>Indonesia</li> <li>Thailand</li> <li>Singapore</li> <li>Malaysia</li> </ul>
<b>Import Substitution</b> (TSI = -0.5 to 0)	<ul style="list-style-type: none"> <li>Myanmar</li> </ul>	<ul style="list-style-type: none"> <li>Lao PDR</li> <li>Myanmar</li> <li>Viet Nam</li> </ul>	<ul style="list-style-type: none"> <li>Lao PDR</li> <li>Myanmar</li> <li>Viet Nam</li> </ul>
<b>Introduction</b> (TSI = -1 to -0.5)	<ul style="list-style-type: none"> <li>Brunei Dar.</li> <li>Cambodia</li> <li>Philippines</li> </ul>	<ul style="list-style-type: none"> <li>Brunei Dar.</li> <li>Cambodia</li> <li>Philippines</li> </ul>	<ul style="list-style-type: none"> <li>Brunei Dar.</li> <li>Cambodia</li> <li>Philippines</li> </ul>

**Fig. 5. The position of SEA countries based on TSI**

almost all SEA countries have seen positive growth in exports and imports with extra-ASEAN countries. Derosa also confirms this (1995), the total benefits of ASEAN trade with the world are higher than intra-ASEAN. For example, Malaysian agricultural exports are more towards extra-ASEAN, namely to new industrial countries such as China, Iran, India and Ukraine. Malaysia exports many animal and vegetable fats and oils to these countries (Alias et al., 2014).

Cambodia, Indonesia, Lao PDR, Myanmar, Thailand, and Viet Nam have strong competitiveness in the intra-ASEAN agricultural trade, while Brunei, Malaysia, the Philippines and Singapore have weak competitiveness. According to Hoang (2020), SEA countries obtain strong competitiveness in crop and crop processing, wood and fishery sectors such as rice, natural rubber, spices, fixed vegetable fats and oils, wood in chips, fuelwood, fish, and crustaceans. However, SEA countries have been less dependent on agricultural exports as they export many manufactured goods (Lairakobsup, 2014). This is shown in Figure 1, where agricultural exports and imports in SEA countries are lower than non-agricultural products.

Then, the AEC was born out of this situation and created a sense of optimism for its member countries. The AEC's implementation improves the agricultural trade performance and competitiveness in SEA countries, causing it to expand steadily on the intra-ASEAN markets. This is consistent with Petri et al. (2012), SEA's deeper integration will allow it to combine further and exploit the production advantages that its diverse membership offers. The AEC's implementation has also opened the door to market access for agricultural commodities in the SEA region. According to Khiyavi et al. (2013), growth in market size is a significant factor in increasing trade in agricultural products from Malaysia, Thailand, and Indonesia.

The AEC's success in increasing intra-ASEAN agricultural trade did not happen suddenly. This is followed by various processes of deregulation of trade policies in each member country. Thailand is the first country in the SEA region to promote agricultural trade in its economy. The political and economic conditions of the 1970s and 1980s were particularly conducive to agribusiness dominance of Thailand's agricultural sector dynamics. Then followed by agricultural modernization around 1980, introducing new production relations linked farmers and agribusiness without the state's intervention. This makes agricultural and agri-industrial exports and manufactures accounted for nearly the same share of total exports by value (44.7% versus 45.7%, respectively) in 1987 (Goss & Burch, 2001). Moreover, Thai government spending on agriculture can increase food consumption, exports, and employment, capital stock and GDP in the agricultural sector (Jaroensathapornkul & Tongpan, 2007).

As a result, it's not shocking that trade in Thai agricultural products grew exponentially after implementing the AEC. The awareness of the population of this country of the influence of AEC is also very high. Even this is up to the farmers level, who have been prepared to face AEC (Lin et al., 2018). This is responsible for the prolonged growth of the economy in Thailand (Diao et al., 2006). However, according to Le et al. (2019), its productivity and environmental performances aren't yet optimal. Many causes of this, including inefficient land usage, household labor, causal labor, mechanical power, seeds, fertilizers and other inputs. Farmers in Thailand can lower production costs if efficiency can be improved (Athipanyakul, 2018).

Indonesia and the Philippines do not want to fall behind Thailand, so they reform their agricultural trade policies in the 1980s and 1990s, with lower agricultural export tax rates and the removal of export restrictions. These reforms can increase farm prices and agricultural export volumes (Lairakobsup, 2014).

Trade policy reforms were also implemented by Viet Nam, Cambodia, Lao PDR, and Myanmar as the new ASEAN members. They are countries that joined the ASEAN in the mid and late 1990s. The fast growth of agricultural trade in Viet Nam has started in the 1980s when launched economic reforms (Doimoi for Viet Nam), which led to the increased role of the market in economic development (Nguyen et al., 2018). Production rights to land were returned to households, and input and output markets were liberalized (Abman & Carney, 2020; Thoburn, 2004). This effort was also followed by a transition to higher-value crops and credit support from banks (Ayerst et al., 2020; Trần et al., 2020). As a result, between 2006 and 2016, Viet Nam robust growth in agricultural output averaging nearly 4% per annum. Viet Nam also became the leading exporter of rice and other cereals (mainly maize), coffee, cocoa, cashew nuts, and pepper, both to intra-ASEAN and the world market (Ayerst et al., 2020; Maitah et al., 2020).

The Lao PDR also promotes trade liberalization and the transition to commercial agricultural production. As a result, this increases agricultural product exports, farmers' income, and the country's ability to respond to the change of market demands, especially product quality and volume (Alexander et al., 2017; Castella & Bouahom, 2014; Durevall & van der Weide, 2017; Stuart-Fox, 1998). Myanmar's economy has benefited from its openness, especially in obtaining lower prices from imported products (Nicholas et al., 2018). Cambodia took similar steps to open its market to agricultural product trading (Fukase & Martin, 2001).

These policies have been implemented long before the AEC, even before AFTA. However, AEC effectively raises

awareness of each SEA country to trade with other countries in one region. Even though not all SEA countries take advantage of the open-access market policy, for example, Singapore initiates agricultural trade reform policies in the mid-1980s, re-exporting agricultural products on a large-scale extra-ASEAN (Nabi & Kaur, 2019; Neville, 1992). There are also countries whose competitiveness has declined, such as Cambodia, Lao PDR, and the Philippines. Intense rivalry with other SEA countries is the cause of this condition. Moreover, the agricultural products traded in this region are nearly identical, especially in terms of quality. Pasara (2020) has revealed that RMIs can reduce export volume and competitiveness for their participants, especially small countries.

Next, our study's findings also indicate that the AEC's implementation has no negative consequences for trade with non-member countries. The value of extra-ASEAN imports has remained high and has risen after the AEC was implemented. This contradicts Baldwin's claim (1997), RMIs will harm non-member countries, such as trade diversion, harm their exports and make them less competitive than member countries. We believe this is because SEA countries, both individually or collectively, have various trade agreements with other countries outside the SEA region, such as China, Japan, India, and others.

Last, the most critical finding of our study is proving Covid-19 disturbs the performance and competitiveness of agricultural trade in SEA countries. This finding is consistent with our predictions and statements Gharleghi et al. (2020), the Covid-19 pandemic will affect trade in the SEA region. This situation could be due to a drop in economic growth after the recession, very low oil prices, low production rate, and an increase in unemployment. Moreover, developing countries remain vulnerable to external shock (de Medeiros et al., 2017). Furthermore, the most serious consequences of the pandemic recession for SEA economies are still uncertain and largely unpredictable. Regional trade barriers and distorted distribution channels, in general, place unprecedented strains on SEA. All these interventions aim to prevent the virus from spreading through cross-border trade and ensure that the domestic market is well-stocked (Djalante et al., 2020).

However, we still believe that the AEC is one of the few ways to mitigate the negative impact of Covid-19. Shimizu (2021) stated AEC would become more critical in the face of protectionism and during and in the post-Covid-19 pandemic era. RMIs proved as the comprehensive environment that contains economic benefits and conducive institutions (Shi & Yao, 2020). Several SEA countries' trading patterns and competitiveness have improved. Moreover, Singapore is in the SEA region, one of the world's trade centers and

has shown the ability to recover from external shocks rapidly (Nyen Wong et al., 2015). But we need to provide recommendations for strengthening the AEC to improve agricultural trade performance and competitiveness, especially intra-ASEAN.

The study shows that the RMI in SEA will increase agricultural intra-trade volume and competitiveness. In the meantime, the Covid-19 pandemic has caused all of them to plummet in the short term. Therefore, we recommend the improvement of AEC by capacity building, technological development, and improvement of the market situation. First, each SEA country needs to improve capacity building and training programs. Agriculture in SEA countries suffers from poor cultivation practices due to weak agricultural institutions, such as ineffective agricultural extension, poor access/connection to markets, limited access to credit, and lack of research and development (Manivong et al., 2014). This situation makes agricultural production insufficient to meet domestic consumption, or in an economy, it is known as excess demand. This limitation hinders exports and reduces the competitiveness of each country. Moreover, the Covid-19 pandemic has harmed trade performance and agricultural competitiveness, especially in the SEA region. Many participants in the agricultural industry must be involved in capacity building and training programs. Calle et al. (2014) stated that this activity needs to involve farmers, field officers, researchers, extension workers, and policymakers. In trade, this activity must also involve traders, companies and exporters (Nugroho et al., 2020; Nugroho & Prasada, 2020). They must collaborate to strengthen capacity building. It is strongly recommended that collaboration be involved between countries in the SEA region.

The scope of capacity building that we recommend to strengthen RMIs and mitigate the negative impact of Covid-19 is on the cultivation aspect and organizational innovation. Agricultural cultivation training is required to increase the quantity and quality of products as well as business efficiency. Later on, this activity will increase the competitiveness of the agricultural product in SEA countries. This training must be accompanied by climate change adaptation and mitigation (Calle et al., 2013). According to Qian et al. (2020), climate change disrupts agricultural production and trade and puts many countries' food security at risk. Moreover, the detrimental effects of climate change in SEA countries will worsen in the future (Shrestha et al., 2019). Aside from the cultivation aspect, capacity building should encourage each agricultural industry participant to innovate continually. Calle et al. (2014) have stated that capacity building in the future is how to shift from technical to organizational innovations.

Second, technology implementation in raw production, processing, trade, and consumption accounts for upstream and downstream synergies (Meynard et al., 2017). Agriculture benefits greatly from implementing technology because it enables rural farmers to carry out various activities effectively and efficiently, thus increasing the agricultural business productivity and profitability, agricultural value, and farmers' share in the value chain of agricultural productions (Cambra Baseca et al., 2019; Dubois et al., 2019; Romani et al., 2020). However, we recommend that SEA countries work together to develop appropriate agricultural technology, enhance technology transfer networks, and conduct participatory research to optimize agriculture in different agroecosystems and conditions. Even SEA countries need to integrate big data and local agricultural resources. The combination will result in precision agriculture, agricultural modernization, and innovation in the regional agricultural economy (Li & Yang, 2021).

Third, improvement of the market situation. Covid-19 has changed the situation in the agricultural market where each country strengthens protection to support its economy. However, this should not be done in the SEA region, as our study indicates that the AEC has many beneficial effects for its members. Collaboration seems to be more successful than trade barriers in boosting each SEA country's economy. Funke et al. (2008) recommend a collaborative short-term and long-term study to identify an improved institutional environment as a determinant of a country's economic recovery from the harmful effects of external shocks. We agree with this idea of ensuring that each SEA country takes coordinated steps that are mutually beneficial.

Furthermore, we recommend strong coordination between food supply chain actors. Nowadays, the food supply chain involves many actors, from farmers, manufacturers, wholesalers, retailers, and supermarkets. However, this system is inefficient and unreliable due to the lack of coordination (Borrero, 2019). Farmers and other market participants in SEA countries must become more coordinated to adjust market demand in product volume and quality (Castella & Bouahom, 2014). They also must be aware of shifting customer preferences. Today, consumers want healthy and environmentally friendly food followed by numerous certification schemes (Borrero, 2019; Clark, 2020), especially after the outbreak of the Covid-19 pandemic, which increased consumer awareness of the risk of virus contamination in agricultural products.

There may be a lot of various consumer demands in each country. As a result, we encourage the need for SEA countries to make agricultural products standardization together. This is to reduce various trade barriers and market rejection

of imported products. In addition, various restrictions have made food distribution difficult. Both individually and collectively, each SEA country must plan effective and efficient logistics channels when trading agricultural products. This begins with an agreement among SEA countries to invest in transportation infrastructure development. Through an integrated infrastructure network, many RMIs have been successful in developing the economies of their members. The success of this project will be determined by its ability to connect SEA country and its willingness to volunteer.

## Conclusions

RMI in the SEA region has been manifested in the AEC agreement to create an exclusive value chain center and offer trade benefits for all member countries. In the short term, the AEC's implementation provides trade benefits for SEA countries by increasing export-import transactions. Moreover, the growth rate of exports and imports increased significantly and was equally distributed across SEA countries (fair economic development). AEC also boosts agricultural products export-import transactions and competitiveness in the intra-ASEAN market. This result indicates that the AEC's implementation has achieved its goals to increase single market benefits and the competitive economic area in the SEA region.

The AEC's excellent performance has been hampered by a formidable obstacle, namely the Covid-19 pandemic. The pandemic has eroded export and import growth. In agriculture, the pandemic has reduced trade value in SEA countries, but it has also made the competitiveness challenging to improve. The pandemic has made SEA countries are unable to take advantage of the AEC's schemes because of various urgent Covid-19 prevention policies. As a result, the situation created by the Covid-19 pandemic not only threatens the SEA region's public health but also undermines all the advantages of RMI. Our study provides a new perspective for economists and researchers that RMIs can be highly vulnerable to external shocks, even for the most resilient RMIs in the world. In fact, external shock in our study did not come from the economy, social and politics. However, the effect continues to wreak havoc on RMI economies.

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**Appendix 1. List of Commodities**

[HS 2-digit code] Commodity
[01] Animals; live
[02] Meat and edible meat offal
[03] Fish and crustaceans, molluscs and other aquatic invertebrates
[04] Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere specified or included
[05] Animal originated products; not elsewhere specified or included
[06] Trees and other plants, live; bulbs, roots and the like; cut flowers and ornamental foliage
[07] Vegetables and certain roots and tubers; edible
[08] Fruit and nuts, edible; peel of citrus fruit or melons
[09] Coffee, tea, mate and spices
[10] Cereals
[11] Products of the milling industry; malt, starches, inulin, wheat gluten
[12] Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit, industrial or medicinal plants; straw and fodder
[13] Lac; gums, resins and other vegetable saps and extracts
[14] Vegetable plaiting materials; vegetable products not elsewhere specified or included
[15] Animal or vegetable fats and oils and their cleavage products; prepared animal fats; animal or vegetable waxes
[16] Meat, fish or crustaceans, molluscs or other aquatic invertebrates; preparations thereof
[17] Sugars and sugar confectionery
[18] Cocoa and cocoa preparations
[19] Preparations of cereals, flour, starch or milk; pastrycooks' products
[20] Preparations of vegetables, fruit, nuts or other parts of plants
[21] Miscellaneous edible preparations
[22] Beverages, spirits and vinegar
[23] Food industries, residues and wastes thereof; prepared animal fodder
[24] Tobacco and manufactured tobacco substitutes