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EXPORT DETERMINANTS OF RCEP NEGOTIATING COUNTRIES: DOES REER MATTER?

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ABSTRACT

With the use of panel data analysis, this study seeks to determine how the Real Effective Exchange Rate (REER) affects the overall exports from the ASEAN-5 nations (Indonesia, Singapore, Malaysia, Thailand, and the Philippines) as well as several neighboring nations (Australia, India, Japan, South Korea, New Zealand, and China). An increase in a country's REER indicates a weakening of the country's trade competitiveness, assuming the other variables remain (*ceteris paribus*). Based on the results of the study, it was found that the effect of REER was different for ASEAN-5 and non-ASEAN and did not significantly affect the total exports of the 11 countries. The REER coefficient is positive for non-ASEAN countries and the value is higher for high-income countries. The REER coefficient is negative for ASEAN-5 countries but not significant. The negative value is more significant for middle-income countries. The effect of REER on total exports can depend on the type of commodity traded in a country (using natural resources that are abundant in the country or not). Export products that rely on imported raw materials cause when depreciation occurs, the price of raw materials becomes more expensive, increases the price of the final product, and also decreases the terms of trade of related products.

Keywords: REER, export, GDP, FDI, population, economic distance.

ABSTRAK

*Dengan menggunakan analisis data panel, penelitian ini bertujuan untuk mengetahui bagaimana Real Effective Exchange Rate (REER) mempengaruhi keseluruhan ekspor dari negara-negara ASEAN-5 (Indonesia, Singapura, Malaysia, Thailand, dan Filipina) serta beberapa negara tetangga (Australia, India, Jepang, Korea Selatan, Selandia Baru, dan Tiongkok). Peningkatan REER suatu negara mengindikasikan melemahnya daya saing perdagangan negara tersebut, dengan asumsi variabel lain tetap (*ceteris paribus*). Berdasarkan hasil penelitian diketahui bahwa pengaruh REER berbeda untuk ASEAN-5 dan non-ASEAN dan tidak berpengaruh signifikan terhadap total ekspor 11 negara tersebut. Koefisien REER positif untuk negara non-ASEAN dan nilainya lebih tinggi untuk negara berpenghasilan tinggi. Koefisien REER negatif untuk negara-negara ASEAN-5 tetapi tidak signifikan. Nilai negatifnya lebih besar dan signifikan untuk negara berpenghasilan menengah. Pengaruh REER terhadap total ekspor dapat bergantung pada jenis komoditas yang diperdagangkan di suatu negara (menggunakan sumber daya alam yang melimpah di negara tersebut atau tidak). Produksi barang ekspor dengan bahan baku impor menyebabkan ketika terjadi depresiasi, harga bahan baku menjadi lebih mahal, menaikkan harga produk akhir, sehingga menurunkan terms of trade produk terkait.*

Kata Kunci: REER, ekspor, PDB, FDI, populasi, jarak ekonomi.

I. INTRODUCTION

International trade is directly affected by exchange rate uncertainty. The price of traded goods is directly related to fluctuations in the exchange rates, so the income and volume of traded goods are also impacted. Weaker exchange rates can increase exports because of lower domestic prices. On the other hand, depreciation also harms exports. Highly imported materials in export-oriented industries result in higher costs so the depreciation of the exchange rate can reduce the ability of production and exports (Firdaus et al, 2019). Depreciation will not significantly impact exports when products produced by a country are sufficiently differentiated so that companies can determine prices (Berman et al, 2009).

Depreciation in ASEAN countries, most of which are developing countries, is allegedly able to increase exports (Chaudhary et al, 2016; Harkat et al, 2022). However, it is suspected that depreciation in the more advanced non-ASEAN countries will not have a significant effect on total exports, and the appreciation of exchange rates in high-income countries will not necessarily reduce the number of exports (Nishimura, 2013).

In developing countries, the impact of unanticipated depreciation can increase competitiveness and export growth whereas, in developed countries, unanticipated appreciation and depreciation will harm export growth (Akdoğan et al, 2023; Đorđević, 2023; Handoyo et al; 2023; Nguyen & Do, 2020). Various studies show that depreciation and volatility of the exchange rate affecting exports may vary in each country (Handoyo et al, 2023; Sugiharti et al, 2020; Zhu et al, 2022). Empirical verification needs to be done so that the real answer about the impact of exchange rate movements can be obtained for ASEAN and the countries in RCEP. Previous studies still provide varied conclusions so analysis using quantitative methods needs to be done. This research is interesting because it will discuss the situation of countries involved in RCEP, both in developing countries such as Indonesia and in developed countries such as Japan and Singapore.

Using panel data analysis, this study aims to examine the impact of REER on the overall exports of the ASEAN-5 countries (Indonesia, Singapore, Malaysia, Thailand, and Philippines) involved in the RCEP negotiations as well as the impact of REER on the overall exports of the non-ASEAN countries (Australia, India, Japan, South Korea, New Zealand, and China). Apart from being involved in the RCEP negotiations, these countries were chosen because Southeast Asia has a strong position relative to China and India (Jones, 2013) and some of them (Indonesia, India, and the Philippines) have attractive economic prospects (Mason, 2011). The analysis was conducted to find out how much REER and related variables affect exports in ASEAN and non-ASEAN countries involved in the RCEP negotiations.

II. RESEARCH METHODS

A. Literature Study

Previous studies have shown relationships between exchange rates and exports, especially in Asian countries (Chaudhary et al, 2016; Nguyen & Do, 2020; Sugiharti et al, 2020; Handoyo et al, 2023). Insignificant impacts of exchange rate movements on exports were also found in previous studies (Berman et al, 2009; Nishimura, 2013; Bussière, 2020). Various studies have been conducted on ASEAN trade and its trading partners, as well as the variables that influence it (Chakravarty and Chakrabarty, 2013; Vahalik, 2004, Nguyen & Do, 2020; Sugiharti et al, 2020; Handoyo et al, 2023). Variables that affect exports include exchange rates and inflation, income, and economic growth (Anshari et al, 2017; Wardhana, 2011; and Huda, 2006).

Trade between the two nations is inversely correlated with their distance from one another and positively correlated with each economy's size (Tinbergen, 1962). This model is known as the gravity model. Tinbergen (1962) formed the following equation to examine bilateral exports of country *i* to country *j*:

$$E_{ij} = \alpha_0 + \alpha_1 \log Y_i + \alpha_2 \log Y_j + \alpha_3 \log D_{ij} + \varepsilon_{ij} \quad (\text{Persamaan 1})$$

With E_{ij} : export country i (exporter) to country j (importer), α_0 , α : intercept, constant, Y_i : Gross National Product (GNP) country i (exporter), Y_j : Gross National Product (GNP) country j (importer), D_{ij} : the distance between the two countries, and e_{ij} is the error term.

The gravity model states that higher income in a country is likely to drive production, exports, as well as import demand. In this model, distance has a negative influence on bilateral trade. The distance will increase transportation costs and create several trade barriers. The gravity model is then developed by adding relevant variables, such as population, to see the effect of population numbers on trade. Mátyás (1997) observed that populations tend to positively affect commerce and the level of specialization by creating benefits from specialization. Conversely, Dell'Ariccia (1999) discovered negative coefficient values on population factors due to the possibility of an increased labor force, increased level of specialization, and increased exportable goods. However, with time, more people tend to live in inferior per capita income environments, which might lead to a fall in exports and output.

Variables commonly used to analyze trade volume are REER, GDP, GDP per capita, population, the distance between countries, exchange rates, inflation rates, the ratio of exports and GDP, trade to GDP ratio, a dummy for countries with the same borders, and a dummy for countries with the same language, and other dummy variables such as participation in the South Asian Association for Regional Cooperation (SAARC), ASEAN, European Union, NAFTA, Middle Eastern countries, and other categories (Martinez-Zarzoso and Lehmann, 2003; Rahman, 2009).

B. Data and Methodology

This research uses gravity variables with panel data analysis to capture differences in individual characteristics in a research period. The data analysis of the panel consists of several stages, namely selection of the regression model, classic assumption tests, model feasibility tests, and interpretation. The study was modified by including related

variables, especially the exchange rate variable (REER) to see its effect on exports. The equation for this research is written as follows:

$$\ln EXPR_{it} = \beta_0 + \beta_1 \ln GDP_{it} + \beta_2 REER_{it} + \beta_3 \ln FDI_{it} + \beta_4 \ln POP_{it} + \beta_5 \frac{DIST_{it}}{1000} + \varepsilon_{it}$$

(Persamaan 2)

With $EXPR_{it}$: country i 's export volume in year t , GDP_{it} : country i 's gross domestic product (real GDP) in year t , $REER_{it}$: country i 's exchange rate index (REER) in year t , FDI_{it} : country i 's foreign direct investment in year t , POP_{it} : country i 's population in year t , $DIST_{it}$: total economic distance of country i to other countries, and ε_{it} which is an error term.

This study will use a sample of ASEAN-5 member countries (Indonesia, Malaysia, Singapore, Philippines, and Thailand) and six trading partners involved in the RCEP negotiations (China, India, Japan, South Korea, Australia, and New Zealand). The time span used is 1995 to 2017. The dependent variables in this study are the total export volumes of Indonesia, Malaysia, Singapore, Thailand, the Philippines, Japan, China, South Korea, India, Australia, and New Zealand, the data of which are obtained from UNCOMTRADE and IMF DOTS. The independent variables used in the study were selected based on literature from literature studies that have been conducted so that the independent variables that are most suitable for this study can be determined, namely: real GDP, exchange rate index (REER), foreign direct investment (FDI), distance inter-state economics (DIST), and population (POP) (Tinbergen, 1962; Martinez-Zarzoso and Lehmann, 2003; Veeramani, 2008; Kandilov, 2008; Thorbecke and Smith, 2010). Sources of real GDP, FDI, and population data are obtained from the Wordbank database. To calculate economic distance, data from the distance calculator and The World Bank are used. The REER index is obtained from the Bank for International Settlements.

All variables were converted to the 2010 base year. REER is analyzed in each category

for ASEAN and non-ASEAN member countries. Descriptions of exports and REER movements are carried out for the whole country. Elimination is carried out for outlier data with criteria of more than 2 standard deviations and 3 standard deviations, and elimination is carried out for FDI data that is negative because the logarithm of negative numbers does not produce any meaning.

There are several differences between this study and previous research, namely: (1) investigating specifically ASEAN-5 countries consisting of Indonesia, Malaysia, Singapore, the Philippines, Thailand, and six non-ASEAN countries involved in the RCEP negotiations namely China, India, Japan, South Korea, Australia, and New Zealand, (2) the time used in the study was 1995 to 2017, (3) using panel analysis with gravity variables. The study of export products to support this research uses The United Nations Conference on Trade and Development (UNCTAD) data with the Revision 3, 1-digit, and 3-digit Standard International Trade Classification (SITC) code.

Endogeneity causes estimation results to be biased. There may be endogeneity in research variables, but this study is not intended to review the endogeneity of each variable directly, but rather overcome it by applying fixed effects in panel data analysis because the fixed effect method estimator can remain consistent (Hill et al, 2001). This research specifically wants to see the effect of the exchange rate (REER) on exports in RCEP member countries.

III. RESULTS AND DISCUSSION

The results and discussion are divided into several sections. The first section contains a general description of exports and the exchange rates of the countries concerned. The second and third sections each contain estimation results and a special discussion of ASEAN-5 and non-ASEAN. The last section contains a comprehensive review of the results obtained in the previous points.

A. General Description of Exports and Exchange Rates

Broadly speaking, the export growth graph in 11 countries shows almost the same

movement. China's total exports experienced a rapid increase compared to 10 other countries, from 1995 to 2017. It was also found that exchange rate depreciation had different effects for each country. The superior export commodities of each country are relatively the same from year to year. High-income countries have tendencies in machinery products and transportation equipment and chemical products, while middle-income countries have comparative advantages in sectors that use abundant natural resources. With the differences in comparative advantages of the export products of these countries, the effect of REER on exports of each country will also be different.

B. Results and Discussion for ASEAN-5 Countries

ASEAN-5 countries analyzed included Indonesia, Singapore, Malaysia, Thailand, and Philippines. From the test results, the best method is fixed effect. The test of heteroscedasticity shows that there is a heteroscedasticity problem for the GDP and DIST variables. To overcome this problem, fixed effect method was used with the standard error method and White (diagonal) variance coefficient. Obtained estimation results as follows:

$$\ln EXPR_{it} = 48.58 + 0.29 \ln GDP_{it} + 0.001 REER_{it} + 0.12 \ln FDI_{it} + 2.31 \ln POP_{it} + 0.01 \frac{DIST_{it}}{1000} + \varepsilon_{it}$$

With EXPR: export volume, GDP: Gross Domestic Product (real GDP), REER: exchange rate index (REER), FDI: Foreign Direct Investment, POP: population, and DIST: economic distance between nations. The F-test demonstrates that each independent variable affects the dependent variable simultaneously, indicating the value of the model in explaining how the independent factors affect the dependent variable. Only 84.88% of the dependent variable is influenced by all of the independent variables; the remaining fraction is influenced by variables not included in the model.

Looking at the estimated coefficients obtained, it can be interpreted that gross domestic product has a positive relationship to exports, but does not significantly affect total exports. The REER variable has a negative coefficient but is not significant. The outcomes are consistent with Wilson's (2001) study, which examined the impact of exchange rates on commerce between Korea, Singapore, and Malaysia. The nations of Singapore and Malaysia are not significantly impacted by the real exchange rate. The panel data analysis results are consistent with the findings of Lal and Thomas (2002), who discovered that, except for Japan, the depreciation of the currencies of South Asian countries (Indonesia, South Korea, Malaysia, the Philippines, Singapore, and Thailand) can lead to a long-term increase in the trade balance.

The FDI variable has a positive coefficient. The greater the FDI that enters the ASEAN countries, the greater the export. POP variable has a negative coefficient. Because of their significant impact on exports, policies are needed to control the population and increase productivity in ASEAN-5 so that future demographic bonuses can have a positive impact on exports. DIST / 1000 has a negative coefficient, exports are inversely correlated with the size of the economy and the distance between countries.

C. Results and Discussion for Non-ASEAN Countries

Non-ASEAN countries analyzed included Australia, China, India, Japan, South Korea, and New Zealand. The method used is a fixed effect. Heteroscedasticity problems were found so the fixed effect method was used with the standard error method and White (diagonal) variance coefficient. Estimation results are written as follows:

$$\ln \text{EXPR}_{it} = 23.29 + 0.55 \ln \text{GDP}_{it} + 0.001 \text{REER}_{it} + 0.08 \ln \text{FDI}_{it} + 1.02 \ln \text{POP}_{it} + 0.006 \frac{\text{DIST}_{it}}{1000} + \varepsilon_{it}$$

With EXPR: export volume, GDP: Gross Domestic Product (real GDP), REER: real exchange rate index (REER), FDI: Foreign Direct Investment, POP: country population, and DIST: economic distance between countries. The F-test results, which show that all independent variables jointly influence the dependent variable, support the model's viability. The adjusted R-squared result indicates that 97.52% of the dependent variable is influenced by all of the independent variables, with the remaining 2% being influenced by variables outside of the model.

Gross domestic product has a positive relationship with exports. The REER coefficient value is positive but not significant for the significance level of 1%, 5%, or 10%. According to Ding (2014), who discovered that there was no long-term relationship and that the real effective value of the Renminbi had a relatively weak relationship with total Chinese exports, the results obtained are consistent with Wilson's (2001) research and the negligible results of the relationship between the exchange rate and total exports. The coefficient on FDI is positive, in other words, the greater the FDI, exports will increase. The population has a negative coefficient. From these results, it is known that the increase in population does not reflect an increase in productivity to drive exports. Economic distance has a negative coefficient which means that the economic distance of one country from another country in the RCEP region can reduce exports. Estimation results for ASEAN and non-ASEAN countries are in Table 1.

Table 1. Analysis Results for ASEAN and Non-ASEAN Countries

Variable	ASEAN				Non-ASEAN				
	Coeff.	Prob.	Coeff.	Prob.	Variable	Coeff.	Prob.	Coeff.	Prob.
C	48.5807	0.0024	Positive	Significant at $\alpha=1\%$	C	23.3874	0.0432	Positive	Significant at $\alpha=5\%$
LnGDP	0.2979	0.6349	Positive	Not significant	LnGDP	0.5501	0.0114	Positive	Significant at $\alpha=5\%$
REER	-0.0010	0.7104	Negative	Not significant	REER	0.0010	0.5109	Positive	Not significant

Variable	Coeff.	ASEAN			Variable	Coeff.	Non-ASEAN		
		Prob.	Coeff.	Prob.			Prob.	Coeff.	Prob.
LnFDI	0.1196	0.0342	Positive	Significant at $\alpha=5\%$	LnFDI	0.0773	0.0174	Positive	Significant at $\alpha=5\%$
LnPOP	-2.3095	0.0066	Negative	Significant at $\alpha=1\%$	LnPOP	-1.0164	0.0493	Negative	Significant at $\alpha=5\%$
DIST/1000	-0.0141	0.1233	Negative	Not significant	DIST/1000	-0.0066	0.0009	Negative	Significant at $\alpha=1\%$
Numb. of observ.		109			Numb. of observ.		129		
R-squared		0.8614			R-squared		0.9772		
Adjusted R-squared		0.8488			Adjusted R-squared		0.9752		
Prob. (F-statistic)		0.0000			Prob. (F-statistic)		0.0000		

Source: data processing from SPSS

D. Overall Review

Based on the previous results, it was found that the REER value did not significantly affect the total exports so further discussion was needed. According to the literature, there are differences in the effect of REER on total exports between developed and developing countries (Kandil, 2008; Nishimura, 2013). It was found that the REER movement can be different for ASEAN-5 and non-ASEAN countries in RCEP as follows: (1) the effect of REER on total exports tends to be greater and there is a negative relationship in developing countries (middle income) compared to developed countries (high income), in line with Hall et al (2010), Kappler et al (2013), and Grossman et al (2014). REER which is negatively related to total exports (depreciation can increase exports) can help post-crisis economic recovery for ASEAN countries. (2) the effect of REER on total exports can depend on the type of commodity traded in a country (using natural resources that are abundant in the country or not). Export products that rely on imported raw materials cause when depreciation occurs, the price of raw materials becomes more expensive, increases the price of the final product, and also decreases the terms of trade of related products.

REER that is not negatively related to total exports can be caused by: (1) when depreciation occurs, the price of imported goods increases because the value of the domestic currency compared to a basket of other foreign currencies is sagging. Some industries import raw materials from abroad. Users of imported goods must pay more, while some of the imported goods are capital goods so the profits derived from exports are not proportional to the purchase price of

imported raw materials. (2) When there is a depreciation, interest payments, and foreign debt installments become larger without increasing new debt.

The results are in line with research by Alemu and Lee (2014) who investigated finding no evidence of the impact of depreciation that increases exports. This REER calculation does not consider the global production chain which has stages of production with components from various countries. From the research results obtained, it is necessary to reassert the impact of REER on total exports for the short and long term. The appearance of different REER coefficient marks may be influenced by the time of the study, so it needs further investigation of the impact of exchange rate movements for various time frames. In the panel data analysis that has been done, all the fixed effect methods have been chosen through the Chow and Hausman test. This is following Nachrowi and Usman (2006) which states that the fixed effect model can be used when the panel data owned has a greater time dimension than the number of individuals.

REER has a negative effect on total exports in the ASEAN-5 group of countries and is more significant for middle-income countries. REER has a positive but not significant effect on total exports in the group of non-ASEAN countries. The estimation results show that the overall REER effect does not significantly affect total exports for ASEAN-5 and non-ASEAN countries in RCEP. Thus, it can be concluded that the effect of REER on exports may vary depending on the characteristics of each country. Other variables that are thought to affect total exports have the same coefficient mark for each group of countries. Gross domestic product and foreign

investment have a positive effect on exports, while population and economic distance have a negative effect on exports.

IV. CONCLUSIONS

The effect of REER on the total exports of 11 Regional Comprehensive Economic Partnership (RCEP) countries was analyzed using panel data. Factors that influence exports (EXPR) in the estimation equation are gross domestic product (GDP), exchange rate (REER), foreign investment (FDI), country population (POP), and economic distance between countries (DIST).

The fixed effect is used as an effective approach for ASEAN-5. The overall exports are negatively impacted by the REER variable, though not significantly. Total exports are positively impacted by the variables related to GDP and FDI. Exports are significantly and negatively impacted by population density and economic distance. In the meanwhile, a fixed effect is the most accurate assessment method for non-ASEAN nations. The overall exports are positively, but not significantly, impacted by the REER variable. Exports are positively and significantly impacted by both the GDP and FDI. Exports are significantly and negatively impacted by population density and economic distance.

An increase in a country's REER indicates a weakening of the country's trade competitiveness, assuming the other variables remain constant. Because the increase in a nation's REER is an indication that its exports are becoming more expensive, and its imports are becoming cheaper. It is losing its trade competitiveness. However, based on the results of the study, it was found that the effect of REER was different for ASEAN-5 and non-ASEAN and did not significantly affect the total exports of the 11 countries. The REER coefficient is positive for non-ASEAN countries and the value is higher for high-income countries. The REER coefficient is negative for ASEAN-5 countries but not significant. The negative value is more significant for middle-income countries.

The effect of REER on total exports can depend on the type of commodity traded in a

country (using natural resources that are abundant in the country or not). Export products that rely on imported raw materials cause when depreciation occurs, the price of raw materials becomes more expensive, increases the price of the final product, and also decreases the terms of trade of related products.

The results of the study note that the effect of REER varies and does not significantly affect the total exports of the countries studied. Perhaps this difference is due to the period of the study so it is necessary to further study the impact of the REER movement on total exports in the short and long term for these countries. The REER index calculation is also needed which is more relevant to the phenomenon of global value chains (GVCs) to consider the fact that the goods produced do not only use domestic factors but also use inputs from abroad. Because there are differences in commodities traded between ASEAN-5 countries and other countries in RCEP, the effect of REER on each industry needs to be further investigated in further research.

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