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DETERMINANTS OF TRADE BALANCE IN SOUTHEAST ASIAN COUNTRIES

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ABSTRACT

This study aims to examine the macroeconomic stability in determining the trade balance performance in Southeast Asian countries. Using a panel data analysis in the period of 2005 to 2020, this study analyses whether gross domestic product, energy consumption, domestic consumption expenditure, foreign direct investment and exchange rate affect trade balance based on the method of pooled ordinary least squares in Malaysia, Thailand, Singapore, Philippines, and Indonesia. Results of the study demonstrates that energy consumption and foreign direct investment positively affected trade balance. A country's energy demand may be positively impacted by increased energy use, especially for renewable energy, which may help the trade balance by lowering imports of other energy sources. As FDI flow increases, international companies are encouraged to create domestic import substitution, resulting in lower imports and a favourable influence on the trade balance. The prime factor that has a significant negative impact on trade balance is domestic consumption expenditure. Consumption expenditures have an inverse relationship with the trade balance since they might rise along with household income, especially when it comes to imports. This study contributes by providing significant information to help the authority to identify measures to be taken to improve the trade balance performance. To enhance the study's findings, it is recommended that future research use more sophisticated techniques, such as the ARDL or nonlinear ARDL model. Future research may also consider a longer period of observation, including the COVID-19 period, as well as other variables that are important in explaining trade balance.

1. Introduction

In the age of global rivalry, trade, which was once considered a vital injector of economic expansion, has taken on surprising importance on a country's economic growth. Technology shifted from developed to developing countries, transforming the world into a global village. Since the 1980s, the development and invention of high technology has increased economies' reliance on one another (Jadoon and Guang, 2019). Trade balance is the difference in total value between exports and imports which is a concept in international trade over a specific period (Edokobi, Okpala & Okoye, 2021). It is vital for a particular country to obtain a trade surplus which occurs when a country's exports exceed its imports. Trade surplus can help an economy thrive by creating jobs. Moreover, it can also help strengthen a country's currency against other currencies, altering currency exchange rates. Nonetheless, this is dependent on the amount of goods and services produced by a country in contrast to other countries, as well as other market conditions (Kenton, 2020).

A country needs a variety of measures in terms of economic variables such as tariff structure, currency rates, import restriction, export taxation, and a foreign exchange allocation mechanism in order to improve the balance of trade and stimulate economic activity and development. As the world hopes for a comeback from the pandemic recession, international trade has been one of the key factors that shape the crisis after the pandemic in Southeast Asia. Although trade has caused a few global downturns, it has also been at the heart of the recovery, particularly as global public-sector lockdowns were progressively lifted, and the government unveiled massive fiscal stimulus programmes. Southeast Asia's exports have benefited from a spike in demand for personal protective equipment, electronics, and other products that allow people to work from home (Rajah, 2021).

According to data from the Vietnam News Agency (2021), the coronavirus pandemic that struck Southeast Asia has led exports from six Southeast Asian countries to decline 2.2 percent to \$1.35 trillion in 2020. The Philippines saw a 10.1 percent drop in exports, followed by a 6.0 percent drop in Thailand, a 4.1 percent drop in Singapore, and 2.6 percent drops in Malaysia and Indonesia among the five other members of the Association of Southeast Asian Nations. Therefore, it is predicted that the income per capita in the ASEAN-5 economies, i.e., Indonesia, Malaysia, Philippines, Thailand, and Vietnam will be lower than predicted before the pandemic hit (International Monetary Fund, 2021).

According to the Asian Development Outlook (2019), the new forecasts reflect bleak international trade prospects, owing in part to escalating trade tensions between the People's Republic of China and the United States, as well as slowing economic growth in advanced economies and large developing Asian economies. Consequently, the global macroeconomic crisis and the changes in the international trade pattern have highlighted the need for understanding the factors underlying a country's balance of trade position.

Therefore, this study aims to examine the effect of economic variables, namely gross domestic product per capita, energy consumption, foreign domestic investment, domestic consumption expenditure and exchange rate towards the trade balance in Southeast Asian countries from the year 2005 to 2020. A total of five countries were selected namely, Malaysia, Thailand, Singapore, Philippines, and Indonesia. These countries are known to be the countries grouped

under the Association of Southeast Asian Nations (ASEAN) which specifically have seen substantial economic development since the mid- 1960s.

This study is significant as it will be able to help the government to identify measures that can be taken to improve the trade balance performance. The results derived from this study may provide information that aid regulators in mapping out, creating, and establishing regulatory requirements for the management and growth of trade balance, therefore increasing global interest in the particular country's trade activities.

The paper is organised as follows: Section 2 describes the literature review. Data and methodology is provided in Section 3. Section 4 presents results and discussion. Finally, Section 5 provides the conclusion and recommendation for future research.

2. Literature Review

Economic performance appears to be significant to the balance of trade (Panshak, Civrir & Ozdeser, 2019; Manual and San, 2019). Increased economic efficiency boosts international trade and trade balance. International trade boosts the global economy and at the same time can become an important driver of the country's economic growth (Blavasciunaite, Garsviene & Matuzeviciute, 2020). Various research on trade balance have been conducted in both developed and developing countries with a vast number of empirical research focused on the literature on economic performance and trade balance.

According to Alessandria and Choi (2021), trade balance reflects cross-country disparities in the business cycle caused by country-specific productivity, monetary, and fiscal shocks, as well as longer-term structural asymmetries caused by demography, social insurance, or wealth. Contrary to popular belief, cross-country disparities in trade barriers or trade policy are key determinants of the trade balance. Dodzin and Vamvakidis (2004) studied the impact of international trade on developing countries' output allocation across sectors from 1960 until 2000 and found that international trade has an impact on a country's economic growth. Trade shifted the economy from small-scale to large-scale production, as well as from agricultural to industrial sectors, resulting in increasing need for raw materials. Consequently, the economy is expanding efficiently from all sides, with output rising due to exports and the industrial sector of the economy fast expanding, which is seen as an indication of rising international demand for product commerce. In developing countries, output is being distributed across sectors to help them catch up to their developed counterparts. The literature revealed that trade and economic growth were inextricably linked, and that trade has effectively boosted a country's economic progress (Jadoon & Guang, 2019).

GDP has a considerable impact on the trade balance; higher imports are induced by rising GDP, resulting in a drop in the trade balance. Duasa (2007) supported that income (GDP) and money supply appear to have a significant impact on trade balance in Malaysia from 1974 to 2003. The same results were supported by Saeedi and Rana (2021) in the study that involved selected emerging countries from 1990 to 2015. Rahmawati (2014) found a negative significant relationship between income and trade balance in Indonesia from 1980 until 2012 which supports the Keynesian view. The trade balance may worsen as income increases as it will encourage consumers to buy more imported goods than exported ones. However, this impact can only be observed in the short- term period. However, Ektiarnanti, Rahmawati and Fauziah (2021) showed that GDP has no effect on the trade balance in the same country. Their findings suggested that as the ability to produce domestic items and services has improved, it is required to eliminate the

need to import; if a surplus exists, it can be exported, resulting in a positive trade balance. This conclusion can be used by the government as a reference when developing policies.

Energy has long been a critical component of industry and economic development. Energy consumption reflects the quality of life and is in line with economic growth and trade expansion. However, the consequences of energy use and balance trade have yielded conflicting findings in earlier research. Hanif (2017) conducted a study in developing countries namely, Latin America and the Caribbean between 1990 and 2015, believing that energy usage can affect environmental repercussions. A higher-level energy usage, particularly for renewable energy, can favourably influence the country's energy demand, as well as enhance the trade balance because of lower imports of other energy sources to the countries. Tang, Tan and Ozturk (2016) demonstrated that energy use and economic growth are cointegrated in Vietnam based on the neoclassical Solow growth framework for the 1971–2011 period. In addition, energy variables such as oil demand shock were positive to trade balance in Russia but inversely affected China during 1993 to 2008 (Balli, Çatık & Nugent, 2021).

By using panel data analysis over 1996- 2015 and the fixed, random effects, and pooled ordinary least squares (OLS) methodologies, Tran, Nguyen, and Vu (2020) showed that there is a unidirectional link between energy consumption and trade balance in East Asian countries. However, energy consumption was found to have a negative impact on trade balance. By employing the ordinary least squares method, Shawa and Shen (2013) revealed that energy consumption, specifically on oil and petroleum, has a negative impact on the trade balance, resulting in a larger trade deficit for Tanzania with a sample period focusing from 1980–2012.

The study by Shawa and Shen (2013) found that household consumption spending has a significant negative relationship with trade balance in Tanzania. The rise of household consumption expenditure especially on imports which might be due to the rise of income tends to worsen trade balance. The result was supported by Edokobi et al. (2021) in Nigeria using a time series data focusing on a period of thirty years from 1991-2020 as well as Ousseini and Aboubacar (2017) in the West African Economic and Monetary Union by applying the panel vector autoregression technique from 1980 to 2013.

In the trend of global economic integration, receiving international capital flows through inward foreign direct investment (FDI) have been an important engine for economic growth in each country's economy (Sultan, 2013). Foreign direct investment firms have been identified as an important energy of financing for a developing country. It enhances economic growth and export performance (United Nations Conference on Trade and Development, 2002; Zhang, 2005; Sultan, 2013; Nguyen & Do, 2020). Ray (2012) revealed that foreign direct investment has a significant positive impact on balance of trade in a study on the impact of several drivers on the balance of trade using annual data from 1972-73 to 2010-11 in India. As FDI flow increases, multinational corporations may be motivated to create import replacements domestically, resulting in lower imports and a favourable influence on the balance of trade. Nguyen and Do (2020) observed the presence of a cointegration linkages of inflows of foreign investment, internal trade, and external trade. Inward FDI creates exports by devoting capital in the process of utilization of low-cost labour, knowledge replication, and technology transfer during the period of 2000s where the country has negotiated many free trade agreements with the advanced economies. Higher number of imports can adversely affect the value of Vietnam's exports. A higher level of registered inward FDI volume can positively increase external trade in the long run and negative impact can be found in the short run. In contrast, Shawa and Shen (2013) discovered that foreign direct investment was a significant variable in Tanzania from the years

1980–2012 and positively affected the trade balance, particularly if the multinational company had export as one of its primary goals.

The amount of local currency necessary to purchase one unit of foreign exchange is known as real exchange. Exchange rate dynamics have remained a popular issue in academic writing. This is due to the fact that a country's exchange rate influences its international competitiveness. A country will have a higher competitive edge over its trading partner's currency when the value of a country's exchange rate currency falls (Sa'ad, Abraham, & Michael, 2018). Liew, Lim and Hussain (2016) investigated the relationship between Asian countries' exchange rates and trade balances, namely, Indonesia, Japan, Malaysia, Philippines, Singapore, and Thailand from 1955 until 2006. They showed that real money has a greater impact on the trade balance than nominal money. As a result, governments rely on policies that focus on the variable of real exchange rate, which is the nominal exchange rate to aggregate price level in order to achieve the desired impacts on trade balance. At the same time, devaluation-based policies that are affected by changes in the nominal exchange rate must work in combination with stabilization measures to achieve the desired level of trade balance to ensure domestic price level stability.

Purwono, Mucha and Mubin (2018) examined the influence of exchange rate volatility on the current account deficit from 2005 to 2014 in Indonesia. It had occurred that the current account deficit increased depreciation. The decrease in export of manufactured goods, especially gas and non-oil, is higher than the increase in import. Depreciation of the country's currency against the US dollar results in an increased burden of higher oil and gas imports due to import transactions for the oil and gas sector. By employing the cointegration techniques, Engle-Granger test, vector error correction model (VECM), and impulse response analyses, Ng, Har and Tan (2008) suggested that the correlation between trade balance and exchange rate exists in Malaysia from year 1955 to 2006. They demonstrated that a long run relationship exists between trade balance and exchange rate. Real exchange rate was an important variable and devaluation of currency tends to improve trade balance in the long run. A study by Ray (2012) revealed that real effective exchange rate has a negative influence on trade balance in India because as the real exchange rate depreciates, the balance of trade may shift toward a surplus. It is reasonable to assume that lowering the actual effective exchange rate will raise demand for traded industries' output by stimulating export. Trinh (2014) indicated that in the long run, the real exchange rate has a positive impact on trade balance, indicating that depreciation can enhance trade balance and an appreciation can deteriorate trade balance in Vietnam. However, the impact of real exchange rate appreciation is very limited because of the reliance of export production on imported materials due to the lack of subsidiary industries. As a result, real exchange rate appreciation is not the main determinant of the trade balance deficit. Depreciating the real exchange rate to enhance the trade balance is currently ineffective.

3. Methodology

The sample employed in this study was the original five countries grouped under the Association of Southeast Asian Nations (ASEAN) and are currently the most developed in economic growth, namely, Malaysia, Thailand, Singapore, Philippines, and Indonesia. GDP per capita (Y) is a proxy for economic growth in which it will be measured in millions of USD. Energy consumption (EG) is indicated by the electric power consumption in kWh per capita. Domestic consumption expenditure (DC) is measured using the final consumption expenditure in millions of USD. The foreign direct investment (FDI) is measured using the net inflows of balance of payments (BOP) in millions of USD. Lastly, the exchange rate (EX) is measured by using domestic

currency against USD in millions of USD. The annual data from 2005 to 2020 was used in this study and was retrieved from the World Development Indicator.

The hypothesis statement for this study is stated as follows. As null hypothesis, we hypothesized that there is no significant relationship between the selected variables, namely gross domestic product per capita, energy consumption, domestic consumption expenditure, foreign domestic investment, and exchange rate with and the trade balance.

H₀: There is no significant relationship between the selected variables and the trade balance.

H₁: There is a significant relationship between the selected variables and the trade balance.

The analysis of the study is conducted using the pooled ordinary least squares (OLS) method expressed as follows:

$$TB_{it} = \beta_0 + \beta_1 Y_{it} + \beta_2 EG_{it} + \beta_3 DC_{it} + \beta_4 FDI_{it} + \beta_5 EX_{it} + e_{it} \tag{1}$$

where TB_{it} denotes trade balance performance as a percentage of GDP for each country, $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ denote coefficients of independent variables, Y_{it} denotes gross domestic product per capita, EG_{it} denotes energy consumption, DC_{it} denotes domestic consumption expenditure, FDI_{it} denotes foreign direct investment, EX_{it} denotes exchange rate, e_{it} denotes error term, i denotes top five emerging Southeast Asian countries namely Malaysia, Thailand, Singapore, Philippines and Indonesia, as well as t denotes year 2005 to 2020.

This study hypothesizes that gross domestic product is positively related to trade balance as increases in domestic income raise the demand on money and results in higher exports (Duasa, 2007). Energy is proposed to be positively related to balance of trade as the increased use of renewable energy is favourable as it reduces imports of other energy supplies to the countries (Hanif, 2017). The study posits a negative impact of domestic consumption expenditure on trade balance as higher household consumption expenditure particularly on imports may deteriorate trade balance (Shawa and Shen, 2013; Edokobi et al., 2021 & Ousseini and Aboubacar, 2017). This study postulated that foreign direct investment is positively associated with trade balance due to inflows of foreign direct investment creating export and replacing import domestically (Ray, 2012). Exchange rate is proposed to have a negative impact on trade balance as depreciation in the real exchange rate may increase demand for traded industries' output and lead to the trade surplus (Ray, 2012).

4. Results and Discussion

The result and conclusions of the study are reported in the following section.

Table 1
Descriptive Analysis

	TB (%)	Y(USD Trillion)	EG (kWh)	DO (USD Trillion)	FDI(USD Trillion)	EX (USD)
Mean	33.1865	392453.7	3233.87	215513.95	18152.96	2276.10

Maximum	113.6219	1119091.3	8844.69	648299.7	120439.5	14582.20
Minimum	3.7233	107420	500.65	50928.6	-3760.1	1.25
Standard Deviation	31.8200	244336.9	2819.22	146198.11	25660.59	4636.22

Notes: The dependent variable is trade balance (TB). The independent variables are the gross domestic product per capita (Y), energy consumption (EG), domestic consumption expenditure (DC), foreign direct investment (FDI), and exchange rate (EX).

Table 1 reports the descriptive statistics of the research variables for this study. The mean value for trade balance (TB) and gross domestic product per capita (Y) are 33.19% and US\$392453.7 trillion. The maximum value of foreign domestic investment was US\$120439.5 trillion, and the minimum amount of foreign domestic investment was -US\$3760.1 trillion. The standard deviation of FDI and exchange rate are USD25660.59 trillion and USD4636.22. The dispersion of the energy consumption and domestic consumption expenditure (DO) from their mean are 2819.22 kWh and US\$146198.11 trillion.

Table 2
Correlation Analysis

Variables	Correlation coefficient	p-value	Conclusion
TB vs. Y	-0.3625	0.0010	Negative correlation between the variables
TB vs. EG	0.9182	0.0010	Positive correlation between the variables
TB vs. DO	-0.5281	0.0010	Negative correlation between the variables
TB vs. FDI	0.8335	0.0010	Positive correlation between the variables
TB vs. EX	-0.4131	0.0010	Positive correlation between the variables

Notes: The dependent variable is trade balance (TB). The independent variables are the gross domestic product per capita (Y), energy consumption (EG), domestic consumption expenditure (DC), foreign direct investment (FDI), and exchange rate (EX).

The results from table 2 shows that energy consumption and foreign direct investment have strong correlation with trade balance as shown by the correlation coefficients of 0.9182 and 0.8335. GDP per capita, domestic consumption expenditure and exchange rate are negatively correlated with the trade balance with reported correlation coefficients of -0.3625, -0.5281 and -0.4131.

The results derived from the pooled ordinary least squares are reported in Table 3. This study investigates several models to examine the significant variables that explain the trade balance performance. The results of four selected models are described as follows.

Table 3 shows that Model 3 has lowest AIC. However, there are two insignificant independent variables in Model 3 namely, GDP and DOC. In terms of the diagnostic test results, Model 3 shows a multicollinearity problem. Therefore, the selected model for this study is Model 4. Model 4 comprises three determinants of trade balance, namely energy consumption, domestic consumption expenditure and foreign direct investment. The significance of the F-test suggests that the model is fit and R^2 of 0.9650 showed that 96.50% of the variation of trade balance can be explained by energy consumption, domestic consumption expenditure and foreign direct investment. There is no serious multicollinearity problem, and the error term is not normally distributed.

Table 3

Summary of Regression Model

Variables		Model 1	Model 2	Model 3	Model 4
Y	Coefficient	-3.2204	-	-3.2148	-
	p-value	0.1102	-	0.1081	-
	VIF	51.1979	-	51.1131	-
EG	Coefficient	0.0059	0.0055	0.0059	0.0055
	p-value	0.0000***	0.0000***	0.0000***	0.0000***
	VIF	3.9022	2.6907	3.8899	2.6863
DC	Coefficient	1.0442	-4.6135	1.0903	-4.6115
	p-value	0.7750	0.0000***	0.7598	0.0000***
	VIF	61.2196	4.6447	59.1113	1.5489
FDI	Coefficient	0.0006	0.0006	0.0006	0.0006
	p-value	0.0000***	0.0000***	0.0000***	0.0000***
	VIF	2.2929	2.0192	2.2686	1.9878
EX	Coefficient	2.0449	7.4966	-	-
	p-value	0.9457	0.9980	-	-
	VIF	4.1661	4.1592	-	-
F-test		422.9218	516.8755	535.7612	698.3562
Prob(F-statistic)		0.0000***	0.0000***	0.0000***	0.0000***
R^2		0.9662	0.9650	0.9662	0.9650
AIC		6.5085	6.5182	6.4836	6.4932
Test of assumption					

Normality test Coefficient				
P-value	92.2395	93.0756	93.6308	93.1234
	0.0000***	0.0000***	0.0000***	0.0000***
Multicollinearity	There is multicollinearity	No serious multicollinearity	There is multicollinearity	No serious multicollinearity

Notes: The dependent variable is trade balance (TB). The independent variables are the gross domestic product per capita (Y), energy consumption (EG), domestic consumption expenditure (DC), foreign direct investment (FDI), and exchange rate (EX). *** significant at 1 % level.

Results of Model 4 shows that energy consumption has a significantly weak positive relationship with the trade balance. With the parameter of 0.0055, it shows that when energy increases by one unit, trade balance will increase by 0.0055 units, assuming other things are constant. This finding builds on existing evidence of the study by Tang et al. (2016) who found out that energy consumption has a positive impact on economic growth in Vietnam. In addition, higher energy utilization, particularly for renewable energy, can have a positive impact on a country's energy demand as well as improve the trade balance by reducing imports of other energy sources (Hanif, 2017). The results of their studies confirm the finding from this study in which energy has a positive relationship and is statistically significant with trade balance.

Domestic consumption expenditure is negatively related to the trade balance. With the parameter of - 4.6115, it shows that when DO increases by one unit, TB will decrease by 4.6115 units, assuming other things are constant. The finding is consistent with the study of Edokobi et al. (2021) who found that consumption expenditure has a negative impact on the trade balance as an increase in household consumption expenditure, particularly on imports may be related to an increase in income.

Foreign direct investment is found to be positively related to the trade balance. With the parameter of 0.0006, it shows that when FDI increases by one unit, TB will increase by 0.0006 units, assuming other things are constant. The findings build on the existing evidence of the theory stated by Nguyen and Do (2020) in which they have analysed a study of impact of exchange rate shocks, inward FDI and import on export performance which showed a result that FDI can positively impact external trade. Accordingly, multinational firms may be incentivized to generate import substitution domestically as FDI flow increases, leading in decreased imports and a positive impact on the trade balance (Ray, 2012).

5. Conclusion

This research investigates the economic variables that influenced the trade balance development in five countries namely Malaysia, Thailand, Singapore, Philippines, and Indonesia from 2005 to 2020. Overall, the data show that the trade balance development is influenced by several factors. Economic indicators namely energy consumption, domestic consumption expenditure and foreign direct investment have significant impacts on the trade balance in Southeast Asia during the period of 2005 to 2020. The findings improve the validity of economic research, focusing on the important factors that impact the growth of trade balance in the Southeast Asian Countries.

Our study provides important information to economists and authorities in understanding the determinants of trade balance for better decision making. However, our study is subject to several limitations. As the study examines the impacts of gross domestic product per capita,

energy consumption, foreign domestic investment, domestic consumption expenditure and exchange rate on trade balance in ASEAN-5 over the 2005 to 2022 period using the pool ordinary least square method, therefore, it is recommended that future research to employ more advance methodology such as autoregressive distributed lag (ARDL) model or non-linear ARDL model to improve the results of the study. In addition, future study may consider a longer period of observation which includes the period of COVID-19 and includes other variables that are significant to explain trade balance.

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Authors Contributions

WSIWSB- Writing original draft and BHT- review and editing.

Conflict of Interest

There is no conflict of interest associated with this publication.

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