Exchange Rate and Current Account Balance: Evidence from ASEAN-5 Countries

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Abstract. The aim of this paper was to analyse the impact of the exchange rate and other macroeconomic variables on the current account (CA) balance in 5 Southeast Asia countries between 1991 and 2021. The analysis of this study employs panel data model with fixed effect estimation. The findings show that the currency rate negatively and significantly impacts the CA balance in ASEAN-5 countries. Furthermore, inflation has significantly negative impact, while economic growth and FDI positively and significantly affect the current account. Therefore, developing countries in Southeast Asia need to maintain their exchange rate to reduce the widening current account deficit and sustain positive investor sentiment. Furthermore, they need to increase economic growth, FDI inflows and reduce the inflation rate to increase the current account.

Keywords: Exchange Rate, Current Account Balance, Gross Domestic Product, Inflation, Foreign Direct Investment, ASEAN-5 Countries.

1 Introduction

The current international economy is a continuity of global trade for goods and services to connect economic entities between countries [1]. The international economy has experienced various financial crises in the last three decades, such as the early 1990s recession, Asian financial crisis in 1997-1999, and the global financial crisis in 2008. Those crises lead to a decline of the CA, particularly for developing countries. This becomes a significant problem for many countries as a side effect of world economic globalization. Globalization has increased capital mobility and international trade, affecting in larger CA deficits for many nations [2,3,4]

The 2008-09 global financial crisis caused the world economic growth to drop to -1.6% in 2009 from 4.3% in 2007. This showdown negatively impacted international financial markets, workforce, industrial production, and consumption [5]–[7]. The economic recession could have resulted from several important indicators, such as rising world oil prices, which pushed up food prices, resulting in global inflation [8]. Subsequently, the currency exchange rates of many countries, including ASEAN, fell simultaneously. Additionally, the export performance decreased, especially in largely export-oriented countries [9]. [10], [11] stated

that the impact on a country's trade balance is significant, especially on the CA balance, which is experiencing a decline or a high deficit.

After the 2008 global financial crisis, 5 nations in Southeast Asia , including the Philippines, Indonesia, Thailand, Malaysia, and Vietnam also experienced an economic downturn [12]. Indonesia experienced a significant economic slowdown, declined export performance, an increased deficit in the balance of payments (BOP), and a depreciated rupiah currency [13], [14]. The Philippines experienced its worst point since the 1998 monetary crisis, with economic growth reaching 0.4% in the fourth quarter of 2009. As an export-oriented country, Thailand's economy has also deteriorated due to falling exports and imports [15]. Similarly, Malaysia's economic growth slowed to 0.1% due to falling exports and weak manufacturing demand. Vietnam experienced a decline in imports due to the crisis and recorded a trade surplus of 290 million USD in early 2009.

[16], [17] stated that the factors causing current account fluctuations have become an important concern in international macroeconomics in recent decades. This could be explained by the recent CA imbalances of the economy in the world, especially in developing countries. According to [18], the CA balance is a component of the BOP which includes short-term payment flows, such as imports and exports of goods and services. The exports and imports are recorded on the credit and debit sides, respectively. [19], [20] stated that exports are greater than imports and net transfer means that the income exceeds payments, resulting in a current account surplus. In contrast, exports lower than imports indicate that income is less than payments, resulting in a current account deficit.

Based on the J Curve Theory developed by [21], the devaluation of a country's currency cannot immediately improve the CA balance due to long and short- term negative impacts. According to this theory, the exchange rate appreciation decreases a country's export performance and increases imports. This causes a current account deficit due to falling relative prices. In contrast, a weak exchange rate makes the relative price more expensive, causing a decrease in imports and an increase in exports [22]. [23], [24] found that the exchange rate significantly and positively affects the current account balance. However, this contradicts with the study of [25], which found that the currency rate significantly and negatively affects the CA balance.

Fluctuations in the current account balance are caused by import and export performance [26]. Also, they are caused by domestic macroeconomic performances that determine, such as the exchange rate. Previous studies on the effect of the currency rate on the CA are inconclusive. For instance, [27], [28] showed that the currency rate significantly affects the CA balance. Furthermore, [23] found that the exchange rate had a significant positive effect on the current account balance. However, [25], [29] found that the currency rate significantly and negatively affects the CA balance.

This study examines the impact of the exchange rate and several macroeconomic variables on the CA balance in ASEAN-5 countries using a fixed effect estimation for panel data model. The findings show that the effect of the currency rate on the estimated CA is negative and significant which in line with expectations. Economic growth, inflation, and trade openness explain the decline in the CA. Moreover, FDI improves the CA balance of the ASEAN-5 countries.

2 Literature Review

Exchange rate is defined by the price of a domestic currency against foreign currency [30]. Based on the J Curve Theory, the devaluation of a country's currency cannot immediately

improve the CA balance because of a short-and long-term negative impact. According to [27], [28], [31] the currency rate significantly affects the CA balance. This contradicts with [23], which found that the currency rate had a significant positive effect on the CA balance. However, [25], [29] showed that the currency rate significantly and negatively affects the CA balance.

[32]–[35] investigated the impact of the currency rate on the CA balance. Similarly, [34] examined the effect of change exchange rates on current accounts for 105 developed and developing economies between 1970 and 2011. Their findings showed that the currency rate positively and significantly affected the CA. [33] analyzed the causes of current account changes in Tukey between 2002 and 2014. The findings showed that the currency rate had a significant and negative effect on the CA. Similarly, [32] examined the effect of the exchange rate on the current account in India between 1975 and 2011 using VAR analysis. Their results showed that the currency rate appreciation causes a decrease in the CA balance. [35] analyzed the effect of FDI on the CA in Central Eastern Europe (CEE) countries from 1994 to 2016. They found that FDI positively affected the current account. Furthermore, [17] examined the causes of changes in current accounts in 6 developed countries, including Japan, Germany, Canada, Italy, France, and the UK from 1985 to 2015. The results showed that the currency rate had a positive effect on the CA.

Several other studies assessed the effect of macroeconomic variables on the CA. For instance, [2] analyzed the impact of real GDP, consumer price index, unemployment, export, and import growth rates, as well as public expenditure and foreign trade rates on the CA balance. The study took a sample of several OECD nations from 2005 to 2014, using a binary panel logit approach method. The results showed that public expenditure significantly and positively affected the CA balance. In contrast, the consumer price index and the unemployment rate had significant negative effects. Moreover, [36] examined the impact of FDI on CA balance using the panel method. The results showed that FDI significantly affected the CA balance. [23] analyzed the effect of net foreign assets, trade openness, exchange rate, GDP growth, commodity prices, and REER on the CA balance using samples from developed and developing countries between 1980 and 2011. The results showed that net foreign assets, trade openness, and exchange rate significantly and positively affect the current account balance. In contrast, REER, GDP growth, and commodity prices have a significant negative effect on the current account balance. [25] examined the effect of fiscal balance, FDI, REER, Net Foreign Assets, Saving Investment Gap, REM, Crises Dummy, Development Financial System and Regulation on current account balances in SEE countries using a panel approach from 2000 to 2015. The results showed that FDI and REM positively affect the current account balance, while fiscal balance, REER, NFA, and the saving-investment gap have a negative impact.

[37] examined the impact of fiscal balance, relative income, FDI, financial development, net foreign assets, GDP growth, trade openness, domestic investment, and crude oil balance on the CA balance. The study used samples from five European Union and other countries between 2005 and 2015. The results showed that relative income, FDI, trade openness, and crude oil balance significantly and positively affect the current account balance. On the contrary, financial development, GDP growth, and domestic investment significantly and negatively affect the CA balance, while the other variables have no effect. [29] examined the CA determinants in ASEAN-6 Countries using the panel method. The research was conducted in six ASEAN countries, including the Philippines, Indonesia, Malaysia, Vietnam, Thailand, and Singapore from 2001 to 2016. The independent variables used include GDP, interest and exchange rates, and foreign direct investment. The results showed that all

variables had a significant negative effect on the CA balance. [38] examined the impact of fiscal balance, public debt, real GDP, and age dependency ratio for old and young (ADRO/ARDY) on the CA balance. The samples used were six ASEAN countries during 1990-2016. The results showed that all variables significantly affected the CA balance.

[27] examined the effect of macroeconomics, institutional and financial variables on the CA balance. The macroeconomic variables used were average net crude oil export, growth rate, REER, trade openness, government expenditure, terms of trade, fiscal balance, relative income, and inflation rate. The results showed that the growth rate, terms of trade, REER, trade openness, fiscal balance, and inflation rate significantly affect the CA balance. However, relative income, the average net crude oil export, and government expenditure have no effect on the CA balance. [28] examined the real effective exchange rate on the CA balance using a sample of 58 countries from 1994 to 2014. The results showed that the real effective exchange rate significantly affects the CA balance. [39] examined the influence of GDP growth rate, expenditure growth, FDI, and real interest rate on the CA balance using a sample of developing Asian countries. The results showed that all variables significantly the CA balance.

3. Methods

3.1. Data

This research used a panel data methodology with fixed effect estimation on five ASEAN countries, including Indonesia, Malaysia, Thailand, Vietnam, and the Philippines from 1991 to 2021.

Some control variables that significantly affect the current account balance were added to analyze the effect of the exchange rate on the current account balance. Furthermore, this study included economic growth, FDI, trade openness, and inflation that significantly affect current account balance.

Table 1. Variable Definitions

Variable Name	Type	Measurement	Sources	Period
Current Account (CA)	Dependent	Net exports, primary income, and secondary income as a proportion of GDP.	The World Bank	1991-2021
Exchange Rate (ER)	Independent	The bilateral exchange rate to US dollar	The World Bank	1991-2021
FDI per GDP	Independent	Foreign direct investment inflow to host country as percentage of GDP	The World Bank	1991-2021
Economic growth (Growth)	Independent	Real GDP growth	The World Bank	1991-2021
Inflation	Independent	The change in the current CPI	The World Bank	1991-2021
Trade Openness (Openness)	Independent	Export plus import to GDP ratio	The World Bank	1991-2021

3.2. Econometrics Methodology

We perform panel data with fixed effect estimation to analyze the effect of exchange rate on current account balance. In the equation of our research model, classical assumption testing and other necessary tests will also be carried out. Consider, a simple panel regression:

$$Y_{it} = \beta_0 + \beta_1 X_{it} + u_{it}$$
$$(1)$$

where

$$u_{it} = \mu_{it} + v_{it}$$
$$(2)$$

For one-way error component model, [40] reveals that these unobservable cross section-specific effects can be accounted into the model. The equation for the fixed effect is given:

$$Y_{it} = \beta_0 + \beta_1 X_{it} + \mu_{it} + v_{it}$$
$$(3)$$

For each country observation i, averaging equation

$$\bar{Y}_i = \beta_0 + \beta_1 \bar{X}_i + \mu_i + \bar{v}_i$$
$$(4)$$

Then subtracting Equation (4) from Equation (3) gives:

$$Y_{it} - \bar{Y}_i = \beta(X_{it} - \bar{X}_i) + (v_{it} - \bar{v}_i)$$
$$(5)$$

This study examines the association between exchange rate and CA based on [17], [34] model as follows:

$$CA_{it} = \beta_0 + \beta_1 ER_{it} + \varepsilon_{it}$$
$$(6)$$

By incorporating additional control variables, four different models were created. The first variable is economic growth because of its relationship with the current account balance. Economic growth shows an increase in the ability of domestic consumers to buy consumer goods. According to [2], the gross domestic product does not affect the CA balance. However, [29] found that gross domestic product has a significant negative effect on the current account balance. [38] found that gross domestic product positively affects the CA balance.

The second control variable is FDI inflow, which affects the CA balance. FDI inflows have a favorable impact on the balance of payments due to the appreciation of the country's currency exchange rates. [36], [39] showed that foreign direct investment significantly affects the CA balance. Similarly, found that FDI had a significant positive effect on the CA balance. In contrast, [29] found that FDI negatively affects the CA balance.

This study also used trade openness as a factor affecting the current account balance. According to [27], trade openness significantly affects the CA balance. furthermore, [23], [37] found that trade openness has a significant positive impact on the CA balance.

The last control variable is inflation. According to Keynes's theory, inflation occurs because of the encouragement of people to live beyond their economic capacity. Consequently, the demand for goods becomes higher than the amount available, resulting in an inflationary gap. [27] showed that inflation had a significant impact on the CA balance. Moreover, [2] showed that inflation has a significant negative impact on the CA balance.

Then, models 1 to 4 are:

Model 1:
$$CA_{it} = \beta_0 + \beta_1\, ER_{it} + \beta_2\, Growth_{it} + \beta_3\, FDI_{it} + \beta_4\, Openness_{it} + \varepsilon_{it}$$
(7)

Model 2:
$$CA_{it} = \beta_0 + \beta_1\, ER_{it} + \beta_2\, Growth_{it} + \beta_3\, Openness_{it} + \beta_4\, Inflation_{it} + \varepsilon_{it}$$
(8)

Model 3:
$$CA_{it} = \beta_0 + \beta_1\, ER_{it} + \beta_2\, Growth_{it} + \beta_3\, FDI_{it} + \beta_4\, Inflation_{it}\varepsilon_{it}$$
(9)

Model 4:
$$CA_{it} = \beta_0 + \beta_1\, ER_{it} + \beta_2\, Growth_{it} + \beta_3\, FDI_{it} + \beta_4\, Openness_{it} + \beta_3\, Inflation_{it} + \varepsilon_{it}$$
(10)

where CA is current account as dependent variable; ER is exchange rate; Growth is economic growth; FDI is foreign direct investment inflow; inflation is inflation rate; openness is trade openness; and ε is error disturbance.

4. Results and Discussion

Table 2. Fixed Effect Estimation

Variable	Model 1:	Model 2:	Model 3:	Model 4:
Exchange Rate	-1.2865***	-2.6524**	-3.6695**	-4.6010**
	(0.3867)	(1.2355)	(1.5111)	(2.1054)
Economic Growth	0.4586***	0.5515***	0.3389***	0.5472***
	(0.0313)	(0.1308)	(0.0246)	(0.1067)
FDI	0.3356*		0.2214	0.5066*
	(0.1765)		(0.2571)	(0.2812)
Openness	-0.0902**	-0.0067		0.0327
	(0.0287)	(0.0298)		(0.0434)
Inflation		-0.1234**	-0.0508***	-0.1525**
		(0.0608)	(0.0191)	(0.0717)
C	21.1465***	21.3359***	22.9086***	25.1412**
	(3.6451)	(7.1154)	(7.2940)	(10.5519)
R^2	0.7130	0.7073	0.7039	0.7403
Adjusted R^2	0.6906	0.6848	0.6771	0.7127
F-Statistic	31.7527***	31.4203***	26.1617***	26.7958***

The exchange rate negatively impacted the CA balance in ASEAN-5 countries between 1991 and 2021. Therefore, an increase (depreciation) in the domestic currency currency rate decreases the CA balance. The currency rate depreciates due to supply and demand in the foreign exchange market. This makes imported goods and services more expensive for domestic consumers, forcing the country to spend more on imports. As a result, this results in a current account deficit due to increased imports. This supports the Trade Approach Theory of exchange rate formation. It states that the currency rate of two countries is determined by the size of imports and exports. This means that the exchange rate maintaining the balance of a

country's export and import value is explained by the equilibrium exchange rate. Therefore, when imports are more than exports (indicating a trade deficit), the exchange rate rises (currency depreciation) [41].

The negative impact of exchange rates on the CA balance is in line with the J Curve Theory, which states that the devaluation of a country's currency has a short-and long-term negative impact. Therefore, when the exchange rate depreciates, the price of imported goods becomes relatively more expensive, resulting in a current account deficit. These results support [25], [29], [32], [33], which stated that the currency rate significantly and negatively affects the CA balance. However, this finding contrasts with the works of [17], [34], [35] who find a positive impact of currency rate on current account balance.

Economic growth positively and significantly affected the CA balance. This means that an increase in economic growth raises the value of the CA balance. Production theory explains that national income or gross domestic product is obtained by adding the market value of all goods and services produced by various economic sectors. Therefore, according to this production approach, GDP is the sum of each good and service with the amount produced. An increase in GDP increases the production of goods and services in the domestic market, which increases exports and the current account. This is in line with [29], [38] which stated that GDP positively affects the CA balance.

The FDI shows positively affected the CA balance. This supports the International Trade Theory, which shows a positive link between FDI and the current account balance. According to the theory, capital flows directly impact the BOP through currencyrate appreciation. Furthermore, the exchange rate appreciation rapidly increases exports compared to imports, resulting in a surplus balance of payments. This is in line with [25], [36], [39], which found that foreign direct investment negatively affects the current account balance.

Trade openness negatively affected the CA balance in the ASEAN-5 countries between 1991 and 2021. Trade openness is a measure of the percentage of total exports and imports of goods and services calculated against GDP. Also, it is a system in which economic activities are carried out within a country and have relations with foreign nations. According to the International Trade Theory, a country imports goods when its production factors are scarce and expensive. This is in line with the concept of trade openness which describes the disappearance of tariffs or non-tariffs and the smooth flow of capital between countries. The increase in trade openness in the ASEAN-5 countries was due to increased imports of goods and services, causing a decrease in the CA. [27] found that trade openness significantly affects the CA balance. Similarly, [23], [27] showed that trade openness significantly and positively affects the CA balance.

Inflation positively impacted the CA balance in the ASEAN-5 countries between 1991 and 2021. This means that a rise in inflation decreases the CA balance. Inflation is generally caused by an increase in demand for certain unavailable or scarce goods and services. Moreover, the increase in production costs causes inflation due to expensive raw materials, or high fuel prices and labor wages. Inflation occurs because the money circulating in the community is insufficient. This is in line with Keynes's theory, which states that inflation is caused by the people's tendency to live beyond their economic capacity. Consequently, the demand for goods becomes higher than the amount available, resulting in an inflationary gap. Moreover, an inflationary gap occurs when people start to know what they want, resulting in effective demand for goods. Subsequently, inflation occurs due to a rise in demand for an item to a price level exceeding the maximum limit of the goods produced by the community [9], [42]. There is a significant negative link between inflation and the CA balance. This supports [2], which stated that inflation significantly affects the CA balance.

5. Conclusion and Recommendation

After the 2008 global financial crisis, five countries in Southeast Asia comprising Malaysia, Indonesia, the Philippines, Thailand, and Vietnam experienced an economic downturn. The effects included declined export performance, increased balance of payments deficit, and exchange rate depreciation.

This paper was motivated by a large fluctuation in the current account in ASEAN-5 countries between 1991 and 2021. Therefore, it examined whether the value and several macroeconomic variables increase the CA increase in ASEAN-5 countries. Our findings show that currency appreciation could improve the current account balance. This is in line with predictions and theoretical evidence about the association between currency rates and current accounts. Therefore, a more open economy would cope with external shocks that require a reversal of the CA. FDI and economic growth positively and significantly affect the CA. On the contrary, trade openness and inflation have a negative and significant effect on the CA.

This study suggests that Southeast Asian developing countries should maintain their exchange rates to reduce the widening CA deficit and sustain positive investor sentiment. Furthermore, they should improve their economic growth and FDI inflows to increase the role of exports and the current account. High inflation is detrimental to national economic performance. Therefore, policymakers in the ASEAN-5 countries must reduce inflation to achieve optimal and sustainable economic growth

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