

The Influence of Exports, Imports, Foreign Direct Investment, and Exchange Rates on Indonesia's Current Account Balance 2010 – 2022

Bagus Eka Saputra¹, Fitrah Sari Islami², Emma Dwi Ratnasari³

¹Department of Development Economics, Universitas Tidar, Indonesia

²Department of Development Economics, Universitas Tidar, Indonesia

³Department of Development Economics, Universitas Tidar, Indonesia

Abstract

The current account, a key component of the balance of payments, includes the trade balance, services, investment income, unilateral transactions, and grants, all of which indicate a country's economic position in terms of surplus or deficit. From 2010 to 2022, Indonesia's current account faced varying deficits. This study investigates how exports, imports, foreign direct investment (FDI), and exchange rates affected Indonesia's current account during this period. Using secondary data from Bank Indonesia and the Ministry of Trade of the Republic of Indonesia, and applying the ARDL method in Eviews 12 for both short- and long-term analyses, the study found the following: (1) Exports have a positive effect on the current account in both the short and long term. (2) Imports negatively impact the current account in both the short and long term. (3) Short-term FDI negatively affects the current account, whereas long-term FDI has a slightly positive but not significant impact. (4) Exchange rates contribute positively to the current account in both the short and long term, though the effect is minimal. (5) Overall, exports, imports, FDI, and exchange rates significantly affect Indonesia's current account from 2010 to 2022.

Keyword: current account; exports; imports; foreign direct investment; exchange rates

1. Introduction

An open economy is one that participates in international trade and engages in borrowing and lending within the global capital markets (Muelgini et al., 2020). In today's era of globalization, countries can collaborate beyond their borders, including in economic activities like international trade. When a country participates in global trade, it signals an openness in its economic sector. Naturally, a country aims for economic stability, which is achieved when its economic conditions are favorable. To assess a country's economic state, one can analyze macroeconomic indicators such as the balance of payments (Saputra & Indrawati, 2022). A range of economic activities carried out by each country is documented in a record called the international balance of payments (Nopirin, 2010).

The current account balance provides a summary of a country's trade in goods, investment income, and transactions involving its entities over a given period (Murni, 2013). Current account transactions are crucial for a country as they offer a comprehensive view of its

economic situation (Lapian *et al.*, 2018). According to Sasmiranti *et al.* (2018), a negative current account balance indicates that a country is likely importing more than it is exporting.

Indonesia is one of the countries that operates under an open economic system, which means its economic activities involve interactions with other nations (Sukirno, 2011). However, the current account balance in the country remains a significant concern due to its unstable or fluctuating nature, which often results in deficits. According to data from Bank Indonesia (2023), Indonesia's current account balance began to show a deficit in 2020, primarily due to weakened export activities caused by a decline in global demand. This deficit persisted until 2018, which was the year with the largest shortfall, reaching -30.633 million USD. According to Madura (2011), the condition of the current account balance is primarily influenced by four key factors: inflation, exchange rates, government regulations, and government revenues. Additionally, it is clear that Indonesia's export and import activities also play a significant role in affecting the current account balance.

Each year, Indonesia participates in export activities to fulfill its domestic foreign exchange requirements. A high volume of exports leads to substantial foreign exchange earnings, which can result in a surplus in the current account balance. Conversely, a decline in exports may lead to a potential deficit in the current account balance. According to data from Bank Indonesia (2023), from 2012 to 2016, Indonesia saw a decline in its exports, influenced by unstable global economic conditions and a decrease in both oil and non-oil exports. This reduction in exports contributed to a lower current account balance for Indonesia.

Conversely, Indonesia faces challenges in managing and meeting its domestic needs. Additionally, with its large population, the country becomes an attractive market for a range of commodities from abroad (Wiryanti, 2017). To address these needs, Indonesia must engage in import activities, utilizing foreign exchange as payment. Frequent imports increase foreign exchange expenditures, which can lead to a decrease in the current account balance and potentially create a deficit. On the other hand, reducing imports allows Indonesia to accumulate more foreign exchange, which can improve the current account balance and potentially lead to a surplus.

Based on data from Bank Indonesia (2023), import activities in Indonesia began to increase in 2011, reaching their peak in 2022. According to AntaraNews (2013), the rise in import activities was primarily driven by increased imports of oil and gas products. This upward trend was further supported by strong domestic demand and a rise in capital goods imports. The ongoing increase in imports has contributed to a further depletion of foreign exchange reserves.

Indonesia's current account balance can be influenced not just by the trade balance but also through capital and financial transactions. Fundamentally, foreign direct investment (FDI) has a positive impact on the economy. FDI affects various aspects such as revenue, production, prices, employment, economic growth, and the overall welfare of the recipient country. (Hasanah & Viphindrartin, 2015). Foreign direct investment impacts the current account balance by influencing Indonesia's exports and imports. If FDI increases and leads to higher import levels, the current account balance may decrease, potentially resulting in a deficit. (Tobing *et al.*, 2013).

The data from Bank Indonesia (2023) shows a sharp decline in foreign direct investment in Indonesia in 2016. As reported by *kompas.com* (2016), the decline in foreign direct

investment in 2016 was driven by the fall in oil prices. The decrease in world oil prices by up to 60 percent also contributed to the decline in foreign direct investment in Indonesia.

In Indonesia's international trade, maintaining export stability can be influenced by changes in foreign currency exchange rates. According to Sukirno (2011), the exchange rate reflects the value of one currency relative to another. Fluctuations between the Indonesian rupiah and the US dollar are often used to address balance of payments imbalances. As noted by Nopirin (2010), a depreciation of the exchange rate boosts export activities because it lowers the price of exported goods relative to imported goods. This increase in export capacity can result in a surplus in the current account balance. Conversely, if the exchange rate appreciates, it reduces export capacity and may lead to a deficit in the current account balance (Purwono et al., 2018). Such changes can impact the current account balance, potentially leading to a decrease or deficit.

According to Kementerian Perdagangan (2023), exchange rate data indicates that the US dollar has depreciated relative to the Indonesian rupiah. The highest exchange rate for the US dollar against the rupiah was recorded in 2022 at Rp15,731.00 per USD. As reported by *kompas.id* (2023), this depreciation was attributed to a reduction in the supply of US dollars caused by capital outflows, which resulted from rising benchmark interest rates set by The Fed.

Several studies have produced varying results. For instance, Bagaskoro (2019) found that exports have a positive effect on Indonesia's current account balance, while imports negatively impact it. However, these findings contrast with those of Wiryanti (2017), who reported that neither exports nor imports affected the trade balance or the balance of payments from 2007 to 2016.

Observations from Purwono et al. (2018) suggest that foreign direct investment positively affects Indonesia's current account balance. This contrasts with Tomayahu et al. (2021), who found that foreign direct investment significantly negatively impacts Indonesia's trade balance. Noraditha et al. (2021) reported that the exchange rate has a significant negative effect on the current account balance in both the long and short term. In contrast, Sari (2021) found that the exchange rate has a significant positive impact on Indonesia's current account balance.

The discrepancies between the observed phenomena and previous research findings highlight the need for further analysis of the factors affecting the current account balance. This motivates the author to investigate these factors more thoroughly to ensure a surplus position and showcase Indonesia's economic strength. Consequently, the author has decided to analyze the impact of various factors in a study titled "The Influence of Exports, Imports, Foreign Direct Investment, and Exchange Rates on Indonesia's Current Account Balance from 2010 to 2022".

2. Literature Review

2.1. Keynesian Macroeconomic Theory

Krugman (2015) several economists and statisticians explain the calculation of national income by dividing Gross National Product (GNP) or output into four key components: consumption, investment, government spending, and the current account balance. These components are commonly utilized in national income accounting. Understanding how changes

in these main expenditures affect the economy is essential for analyzing economic recessions and assessing the impact of policies designed to address them.

To calculate domestic income, one can add up total domestic expenditures (C+I+G) and then subtract the value of imports, which represents spending on foreign goods. In an open economy, national income is calculated as the sum of domestic expenditure plus total exports, which reflects foreign spending on domestic goods and services. The national income equation is as follows.

$$Y = C + I + G + (X - M)$$

From the given equation, we can deduce that Y represents national income, C denotes consumption expenditure, I stands for private investment, G indicates government spending, and X-M reflects the current account balance. When X-M is positive, national income exceeds domestic expenditure. Conversely, if X-M is negative, it means that government spending surpasses national income (Reksoprayitno, 2015). This suggests that the current account balance affects the income and expenditure of a country operating within an open economic system.

In practice, a country's international trade balance is rarely perfectly balanced. The disparity between exports and imports is recorded in a specific account known as the current account balance (CA), often represented by the symbol CA (Nanga, 2009). The equation for the current account balance is as follows.

$$CA = X - M$$

It can be said that if imports increase in a country, there is a high likelihood of a deficit in the current account balance. Conversely, if exports exceed imports, there is a high likelihood of a surplus in the current account balance (Nizar, 2013).

Keynes expressed doubt about the presence of automatic or flexible market mechanisms. He believed that achieving balance in the balance of payments did not happen automatically and necessitated government intervention (Sukirno, 2011). Keynes also posited that wages and prices are often rigid, leading to persistent unemployment problems in countries.

2.2 Purchasing Power Parity Theory

This theory will clarify the relationship between exchange rates and inflation and their impact on the current account balance. According to Krugman (2015), the theory explains that currency exchange activities between countries are influenced by each country's price levels. The purchasing power parity theory asserts that a decrease in the purchasing power of a domestic currency leads to its depreciation. Conversely, an increase in the purchasing power of the domestic currency results in its appreciation. Real exchange rate fluctuations affect trade balances, with a decrease in domestic prices of goods and services leading to a lower real exchange rate and encouraging exports. Conversely, an increase in domestic prices causes the exchange rate to rise, prompting more imports.

2.3 J-Curve Theory

This theory explains the relationship between the trade balance and exchange rates over both short and long terms. The J-curve effect illustrates this relationship with a curve resembling

the letter J, showing how the value of a national currency adjusts in response to balance of payments changes from current account transactions. Initially, a depreciation of the domestic currency may lead to a worsening of the current account balance because price adjustments occur more quickly than changes in trade volumes (Marpaung, 2013). The J-curve pattern represents the movement in the current account balance due to exchange rate shifts. In the short term, a depreciated exchange rate can impact the trade balance by intensifying international competition, which boosts exports. This depreciation motivates a shift toward producing domestic goods and services and increases foreign demand for local products..

3. Material and Method

3.1 Design Study

This study employs descriptive techniques with a quantitative approach to systematically and precisely describe the characteristics of the subjects and objects under observation. The aim is to evaluate the impact of exports, imports, foreign direct investment (FDI), and exchange rates on Indonesia's current account balance, considering both short-term and long-term perspectives. The research uses quarterly time series data from 2010 to 2022. Statistical analysis and data management are performed using Eviews 12 software.

3.2 Data Analysis

This research employs the ARDL (Autoregressive Distributed Lag) model to analyze time series data that show varying levels of stationarity. Non-stationary time series data often result in misleading regression results. While non-stationarity suggests a temporary imbalance, there is usually a tendency for a balanced relationship over the long term (Widarjono, 2018). Hence, the ARDL model is suitable for analyzing data with differences in stationarity.

The ARDL model is a regression framework that incorporates both current and past values of independent variables, as well as lags of the dependent variable, as explanatory terms in the model (Gujarati, 2015). It operates on the premise that a variable is affected by its own past values. The ARDL model offers several benefits: it can be used with small sample sizes through bound tests, estimates both long-term and short-term effects concurrently, and addresses issues of autocorrelation and omitted variables.

In this study, the basic model used is written in the following formula.

$$NTB_t = \beta_0 + \beta_1 EKS_t + \beta_2 IMP_t + \beta_3 FDI_t + \beta_4 KURS_t + e_t$$

Explanation:

<i>NTB</i>	: Current Account Balance (in million USD)
<i>EKS</i>	: Exports (in million USD)
<i>IMP</i>	: Imports (in million USD)
<i>FDI</i>	: Foreign Direct Investment (in million USD)
<i>KURS</i>	: Exchange Rate of Rupiah to US Dollar (rupiah per USD)
β_0	: Constant
$\beta_1, \beta_2, \beta_3, \beta_4$: Coefficients of independent variables
<i>e</i>	: <i>error correction term</i>
<i>t</i>	: Year

En the ARDL model, each variable incorporates both long-term and short-term lags. Selecting the optimal lag length is essential for ensuring the model's significance. To create a meaningful model, a specific technique is used to remove non-significant variables. The appropriate lag length is determined based on the Akaike Information Criterion (Widarjono, 2018). The long-term equation for the ARDL model in this study is expressed as follows:

$$\theta_1 Y_{t-1} + \theta_2 Y_{t-1}$$

If there is long-term equilibrium between the variables, then the short-term model equation can be written as follows.

$$\sum_{i=1}^n \beta_1 \Delta Y_{t-1} + \sum_{i=1}^n \beta_2 \Delta Y_{t-1}$$

In the long and short run model equations, the following ARDL model can be written.

$$\begin{aligned} \Delta NTB_t = & \alpha_0 + \sum_{i=1}^n \alpha_{1i} \Delta NTB_{t-1} + \sum_{i=1}^n \alpha_{2i} \Delta EKSP_{t-1} + \sum_{i=1}^n \alpha_{3i} \Delta IMP_{t-1} + \\ & \sum_{i=1}^n \alpha_{4i} \Delta FDI_{t-1} + \sum_{i=1}^n \alpha_{5i} \Delta KURS_{t-1} + \theta_1 NTB_{t-1} + \theta_2 EKS_{t-1} + \theta_3 IMP_{t-1} + \\ & \theta_4 FDI_{t-1} + \theta_5 KURS_{t-1} + e_t \end{aligned}$$

In the equation provided, Δ denotes the lag, α represents the intercept, coefficients α_1 to α_5 represent short-term dynamic correlation concepts, and θ_1 to θ_5 represent long-term correlation models.

To estimate the ARDL model, the Error Correction Term (ECT) is employed to assess short-term impacts on long-term results. The ECT reflects the speed at which adjustments are made toward long-term equilibrium. The coefficient of the ECT is anticipated to be negative and statistically significant at the 5% level (Juarda & Junaidi, 2012). The error correction model in the ARDL model equation can be written as follows (Widarjono, 2018).

$$\begin{aligned} \Delta NTB_t = & \alpha_0 + \sum_{i=1}^n \alpha_{1i} \Delta NTB_{t-1} + \sum_{i=1}^n \alpha_{2i} \Delta EKSP_{t-1} + \sum_{i=1}^n \alpha_{3i} \Delta IMP_{t-1} + \\ & \sum_{i=1}^n \alpha_{4i} \Delta FDI_{t-1} + \sum_{i=1}^n \alpha_{5i} \Delta KURS_{t-1} + \vartheta ECT_{t-1} + e_t \end{aligned}$$

From the equation above, it indicates that ECT_{t-1} represents the error correction variable in the residual of the previous period.

4. Result

Stationarity Test

Table 1. The Result of Unit Root Test at Level

k	ADF-t stat	MacKinnon Critical Value			Explanation
		1%	5%	10%	
NTB	-2.010276	-3.565430	-2.919952	-2.597905	Not stationary
EKS	-0.085754	-3.565430	-2.919952	-2.597905	Not stationary
IMP	-1.589180	-3.565430	-2.919952	-2.597905	Not stationary
FDI	-6.279402	-3.565430	-2.919952	-2.597905	Stationary
KURS	-0.593914	-3.565430	-2.919952	-2.597905	Not stationary

Source: Eviews 12, processed (2024)

According to Table 1, the data processing results show that the ADF-t statistic for the foreign direct investment variable falls below the MacKinnon Critical Value at the 1%, 5%,

and 10% significance levels. This suggests that the foreign direct investment variable does not exhibit a unit root and is stationary at the level. In contrast, the variables for the current account balance, exports, imports, and exchange rates display unit roots, as their ADF-t statistics exceed the MacKinnon Critical Value at these significance levels. Consequently, a unit root test at the first difference level is required for these variables.

Table 2. Result of Unit Root Testing at First Difference Level

Variabel	ADF-t stat	MacKinnon Critical Value			Keterangan
		1%	5%	10%	
NTB	-8.965373	-3.568308	-2.921175	-2.598551	Stationary
EKS	-6.219495	-3.568308	-2.921175	-2.598551	Stationary
IMP	-6.708443	-3.568308	-2.921175	-2.598551	Stationary
KURS	-6.503692	-3.568308	-2.921175	-2.598551	Stationary

Source: Eviews 12, processed (2024)

The table above displays the results of the unit root test performed at the first difference level for variables that were not stationary at the level. The ADF-t statistic values at the first difference are lower than the MacKinnon Critical Values. This indicates that the variables for the current account balance, exports, imports, and exchange rates are stationary or do not exhibit a unit root at the first difference level, according to the critical values at the 1%, 5%, and 10% significance levels.

Determination of Optimal Lag

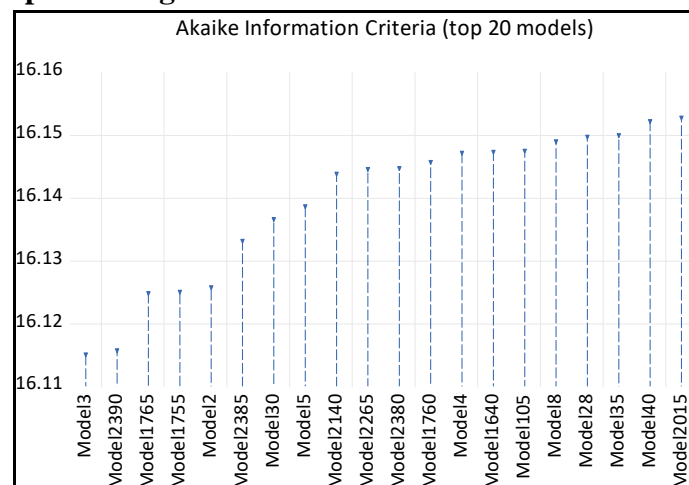


Figure 1. Determination Optimum Lag

Figure 1 presents the results of the optimal lag test, showing that model 3, or ARDL model (4, 4, 4, 4, 2), is the most appropriate among the 20 models evaluated for this study. This model is chosen for its lower error compared to the others. The lag lengths selected are 4 for the current account balance, exports, imports, and foreign direct investment variables, and 2 for the exchange rate variable. Consequently, the ARDL estimation equation model can be expressed as follows:

$$\begin{aligned}
 NTB_t = & 615.9557 + 0.088662NTB_{t-1} + 0.005636NTB_{t-2} + 0.192353NTB_{t-3} + \\
 & 0.352300NTB_{t-4} + 0.805876EKS_t + 0.004366EKS_{t-1} - 0.055331EKS_{t-2} -
 \end{aligned}$$

$$0.206530EKS_{t-3} - 0.310220EKS_{t-4} - 0.921927IMP_t + 0.081361IMP_{t-1} + \\ 0.024548IMP_{t-2} + 0.226887IMP_{t-3} + 0.244873IMP_{t-4} - 0.118105FDI_t + \\ 0.020115FDI_{t-1} + 0.083640FDI_{t-2} + 0.063206FDI_{t-3} + 0.082138FDI_{t-4} + \\ 0.273297KURS_t + 0.149898KURS_{t-1} - 0.404443KURS_{t-2}$$

Cointegration Test

Table 3. Bound Testing Approach Cointegration

<i>F-Bound Test</i>	<i>Null Hypothesis: No levels relationship</i>			
<i>Test Statistic</i>	<i>Value</i>	<i>Signif.</i>	<i>I(0)</i>	<i>I(1)</i>
<i>Asymptotic: n=1000</i>				
F-statistic	3.871328	10%	2.2	3.09
k	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37

Source: Eviews 12, processed (2024)

The table above shows an F statistic value of 3.871328. According to the decision-making criteria, if the F statistic exceeds the upper bound critical value, it indicates the presence of a long-term relationship, leading to the rejection of the null hypothesis (H0). Conversely, if the F statistic is below the upper bound critical value, it suggests no long-term relationship, resulting in failure to reject H0. In this study, the F statistic value exceeds the upper bound critical value, leading to the rejection of H0. This indicates that the ARDL equation model employed in this research reveals a long-term relationship among the variables—current account balance, exports, imports, foreign direct investment, and exchange rate—implying that they are cointegrated.

Classical Assumption Test

Normality Test

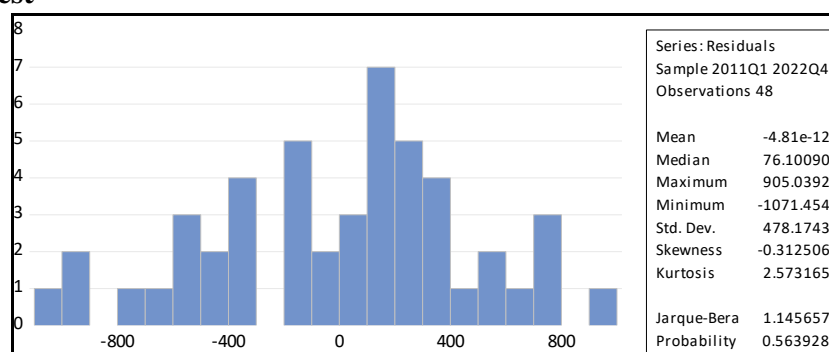


Figure 2. Result of Normality Test

Figure 3 shows the results of the Jarque-Bera Test for normality, with a probability value of 0.563928. Since this value is above the 5% critical threshold, the null hypothesis (H0) is not rejected. This indicates that the residuals follow a normal distribution, suggesting that the data in this analysis conforms to a normal distribution pattern.

Multicollinearity Test

Table 4. Result of Multicollinearity Test

Variable	VIF
NTB(-1)	49.91691
NTB(-2)	53.63346
NTB(-3)	41.86605
NTB(-4)	47.56958
EKS	33.31905
EKS(-1)	272.2032
EKS(-2)	209.7841
EKS(-3)	136.4629
EKS(-4)	118.4672
IMP	16.69435
IMP(-1)	200.9235
IMP(-2)	183.9797
IMP(-3)	136.8696
IMP(-4)	119.9076
FDI	1.511805
FDI(-1)	1.921198
FDI(-2)	1.693212
FDI(-3)	1.921214
FDI(-4)	1.778925
KURS	54.25032
KURS(-1)	98.08108
KURS(-2)	43.29347
C	NA

Source: Eviews 12, processed (2024)

The table above presents the results of the multicollinearity test using the Variance Inflation Factor (VIF). The results show that several variables—namely the current account balance, exports, imports, and exchange rate—have VIF values exceeding 10 at lags 1 through 4. VIF values above 10 indicate the presence of multicollinearity, leading to the rejection of the null hypothesis (H_0). Despite this, multicollinearity was not addressed in this research model because the ARDL model includes lagged variables of the same variable as independent variables. This results in high correlations among the independent variables, but the model remains usable even with these multicollinearity issues (Das & Chatterjee, 2011).

Heteroskedasticity Test

Table 5. Result of Heteroskedasticity Test

<i>Heteroskedasticity Test: Breusch-Pagan-Godfrey</i>			
F-statistic	1.104343	Prob. F(22,25)	0.4026
Obs*R-squared	23.65703	Prob. Chi-Square(22)	0.3655
Scaled explained SS	5.047800	Prob. Chi-Square(22)	0.9999

Source: Eviews 12, processed (2024)

The table above displays a Chi-square probability value of 0.3655. Since this value exceeds the 5% critical threshold, we fail to reject the null hypothesis (H_0), indicating that there is no issue with heteroscedasticity. This suggests that the residuals exhibit consistent variance across observations.

Autocorrelation Test

Table 6. Result of Autocorrelation Test

<i>Breusch-Godfrey Serial Correlation LM Test</i>			
F-statistic	1.026755	Prob. F(2,23)	0.3740
Obs*R-squared	3.934317	Prob. Chi-Square(2)	0.1399

Source: Eviews 12, processed (2024)

The table above displays the Chi-Square probability result as 0.1399, which is above the critical value of 5%. Therefore, it can be said that we fail to reject H_0 , meaning there is no autocorrelation issue. This also indicates that the disturbance variable does not have a relationship with itself in the past.

Statistic Test

Coefficient of Determination

Table 7. Result of Coefficient of Determination

R-squared	0.985776
Adjusted R-squared	0.973259

Source: Eviews 12, processed (2024)

According to the test results, the Adjusted R-square value of 0.973259 shows that 97.3% of the variation in the balance of trade variable is accounted for by exports, imports, foreign direct investment, and exchange rate. The remaining 2.7% is attributed to other factors not included in the research model.

Simultan Test (F test)

Table 8. Result of Simultan Test (F test)

F-statistic	78.75371
Prob(F-statistic)	0.000000

Source: Eviews 12, processed (2024)

The table shows that the simultaneous test (F-test) produced an F-statistic of 78.75371, with a critical F-value of 2.57 at a significance level of 0.000000. Since the computed F-statistic exceeds the critical F-value, the null hypothesis (H_0) is rejected. This indicates that, together, exports, imports, foreign direct investment, and exchange rates have a significant impact on Indonesia's balance of trade. Additionally, the model used in the research is considered appropriate for the analysis.

Partial Test (t test)

Long-term t-test

Table 9. Long-term Model Estimation

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EKS	0.659639	0.226859	2.907712	0.0075
IMP	-0.953497	0.165671	-5.755380	0.0000
FDI	0.362819	0.367273	0.987873	0.3327
KURS	0.051940	0.238211	0.218041	0.8292
C	1706.019	4117.351	0.414349	0.6822
EC = NTB - (0.6596*EKS - 0.9535*IMP + 0.3628*FDI + 0.0519*KURS + 1706.0188)				

Source: Eviews 12, processed (2024)

According to the long-term estimation results, the t-statistic for the export variable is 2.907712, whereas the critical t-value from the table is 1.67793, with a probability of 0.0075. This suggests that, in the long run, the export variable has a significant and positive effect on the balance of trade. In contrast, the t-statistic for the import variable is -5.755380, compared to a critical t-value of -1.67793 with a probability of 0.0000. This indicates that, in the long term, the import variable has a significant negative impact on the balance of trade.

Based on the estimation results, the t-statistic for the FDI variable is 0.987873, with a critical t-value of 1.67793 and a probability of 0.3327. This comparison indicates that the critical t-value is lower than the t-statistic, suggesting that in the long run, the FDI variable has a positive but statistically insignificant effect on the balance of trade. Similarly, for the exchange rate variable, the t-statistic is 0.218041, while the critical t-value is 1.67793 with a probability of 0.8292. Here, too, the critical t-value is lower than the t-statistic, indicating that in the long run, the exchange rate variable has a positive but statistically insignificant effect on the balance of trade.

Short-term t-test

Table 10. Short-term Model Estimation

Variabel	Coefficient	t-statistic	Prob.
D(NTB (-1))	-0.550289	-4.140745	0.0003
D(NTB (-2))	-0.544653	-3.976691	0.0005
D(NTB (-3))	-0.352300	-2.574953	0.0163
D(EKS)	0.805876	17.04494	0.0000
D(EKS(-1))	0.572080	5.046929	0.0000
D(EKS(-2))	0.516749	4.159550	0.0003
D(EKS(-3))	0.310220	2.459690	0.0212
D(IMP)	-0.921927	-20.43877	0.0000
D(IMP(-1))	-0.496308	-3.583693	0.0014
D(IMP(-2))	-0.471760	-3.436920	0.0021
D(IMP(-3))	-0.244873	-1.789458	0.0857

D(FDI)	-0.118105	-2.682734	0.0128
D(FDI(-1))	-0.228985	-4.012200	0.0005
D(FDI(-2))	-0.145344	-2.513996	0.0187
D(FDI(-3))	-0.082138	-1.758017	0.0910
D(KURS)	0.273297	1.099566	0.2820
D(KURS (-1))	0.404443	1.579566	0.1268
CointEq(-1)*	-0.361049	-5.279542	0.0000

Source: Eviews 12, processed (2024)

Based on the earlier estimation results, the export variable shows a t-statistic of 17.04494, with a critical t-value of 1.67793 and a probability of 0.0000. Since the t-statistic exceeds the critical t-value, this indicates that, in the short term, the export variable has a significant positive effect on the balance of trade. In contrast, for the import variable, the t-statistic is -20.43877, compared to a critical t-value of -1.67793 with a probability of 0.0000. In this case, the t-statistic is more extreme than the critical t-value, suggesting that, in the short term, the import variable has a significant negative effect on the balance of trade.

According to the estimation results, the FDI variable has a t-statistic of -2.682734, with a critical t-value of -1.67793 and a probability of 0.0128. This indicates that, in the short term, the FDI variable significantly negatively affects the balance of trade. Conversely, the exchange rate variable has a t-statistic of 1.099566, with a critical t-value of 1.67793 and a probability of 0.2820. Since the critical t-value is higher than the t-statistic, it suggests that, in the short term, the exchange rate variable has a positive but statistically insignificant effect on the balance of trade.

Model Stability Test

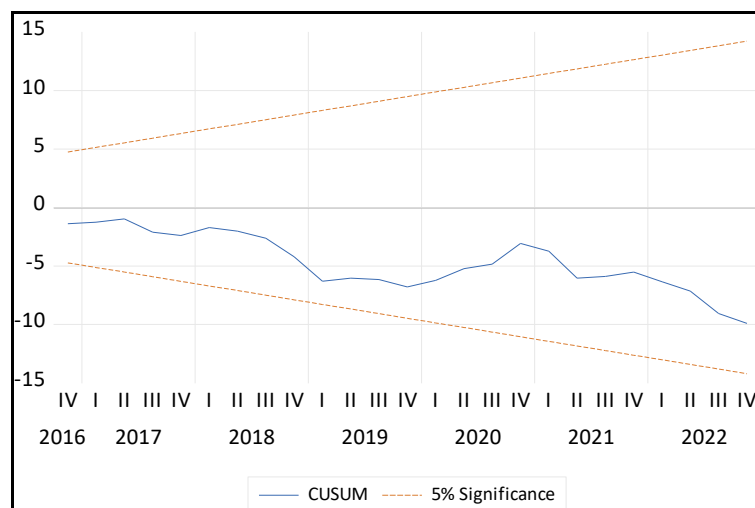


Figure 3. Result of CUSUM Test

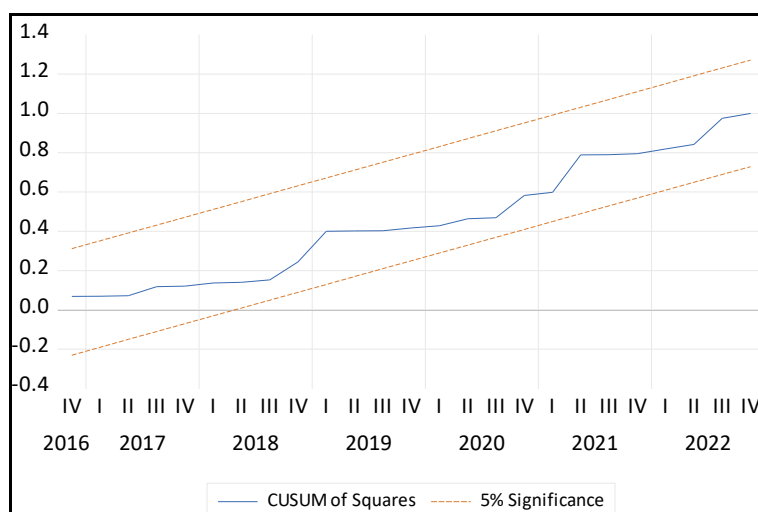


Figure 4. Result of CUSUMQ

According to Figure 4 and Figure 5, the recursive residuals from both the CUSUM and CUSUMQ tests remain within the bands defined by the 5% critical lines (marked in red). This suggests that the model is stable throughout the study period. Consequently, it indicates that the data for the balance of trade, exports, imports, foreign direct investment, and exchange rates remained stable from 2010 to 2022.

5. Discussion

According to the long-term estimation results, the export variable has a t-statistic of 2.907712, while the critical t-value is 1.67793, with a probability of 0.0075. This implies that, in the long run, the export variable significantly and positively affects the balance of trade. These findings align with Bagaskoro's (2019) research, which shows that exports positively impact Indonesia's balance of trade both before and after the subprime mortgage crisis. The crisis, which was a financial market disturbance, disrupted international trade, influencing the performance of exports and imports in open economies.

The import variable has a t-statistic of -5.755380, compared to a critical t-value of -1.67793 with a probability of 0.0000, indicating that the t-statistic is less than the critical t-value. This suggests that, in the long run, imports have a significant negative effect on the balance of trade. This result aligns with Bagaskoro's (2019) findings, which show that imports negatively affect Indonesia's balance of trade both before and after the subprime mortgage crisis. The 2008 financial crisis significantly impacted Indonesia's balance of trade, disrupting international trade and altering Indonesia's trade patterns with its global partners.

The FDI variable has a t-statistic value of 0.987873, while the critical t-value is 1.67793, with a probability of 0.3327. Since the t-statistic is less than the critical t-value, it indicates that, in the long run, foreign direct investment has a positive but statistically insignificant effect on the balance of trade. This finding is consistent with Purwono et al. (2018), which suggests that foreign direct investment positively impacts Indonesia's balance of trade.

In the long term, the exchange rate variable exhibits a t-statistic of 0.218041, while the critical t-value is 1.67793 at a probability of 0.8292. This comparison shows that the critical t-value is less than the t-statistic, indicating that in the long run, the exchange rate variable has a positive but statistically insignificant impact on the balance of trade. This finding is consistent

with the findings of Purwono et al. (2018), which suggest that depreciation of the exchange rate will increase the current account surplus in Indonesia.

In the short term, the export variable demonstrates a t-statistic of 17.04494, compared to a critical t-value of 1.67793 at a probability of 0.0000. Therefore, it can be concluded that the critical t-value is less than the t-statistic, indicating that in the short term, the export variable has a significant positive impact on the balance of trade. This finding is consistent with the research results of Bacovic et al. (2020), which suggest that the export of travel services has a positive impact on the balance of trade because an increase in tourist arrivals in the Mediterranean region through this export.

For the import variable, it shows a t-statistic result of -20.43877, with a t-table value of -1.67793 at a probability of 0.0000, where the t-table > t-statistic. Therefore, it can be concluded that in the short term, the import variable has a significant negative impact on the balance of trade. This research finding is consistent with the results of the study by Ali & Audi (2023), which also suggest that the import variable has a positive impact on the deficit of the balance of trade in developing countries.

The FDI variable exhibits a t-statistic of -2.682734, with a critical t-value of -1.67793 at a probability of 0.0128. Therefore, it can be concluded that in the short term, the FDI variable has a significant negative impact on the balance of trade. This finding is consistent with the research results of Wairooy & Endraswati (2023), which indicate that foreign direct investment has a negative impact on the balance of trade in developing countries. An increase in foreign direct investment inflows will lead to the appreciation of the domestic currency, making imported products cheaper. Consequently, this leads to a decrease in the balance of trade. Furthermore, it is understood that the balance of trade represents the disparity between savings and investment. Hence, an increase in foreign direct investment inflows tends to attract more investment into the domestic economy, thereby potentially reducing the balance of trade.

The exchange rate variable is indicated by a t-statistic of 1.099566, with a critical t-value of 1.67793 at a probability of 0.2820. This comparison shows that the critical t-value exceeds the t-statistic, indicating that the exchange rate variable has a positive but statistically insignificant impact on the balance of trade. This research finding aligns with the results of Wijaya (2019), which suggest that in the short term, the exchange rate has a significant impact on the balance of trade. This condition arises because imported goods, especially oil imports from the United States, will feel more expensive when the Indonesian rupiah depreciates. This will result in an increased burden of oil imports. The impact of the weakening rupiah will disrupt the performance of the domestic industrial sector due to the high prices of imported raw materials.

6. Conclusion, Implication, and Recommendation

Based on the conducted research analysis and review, the study concludes that the export variable has demonstrated a significant positive influence on Indonesia's balance of trade, both in the long term and short term. This finding suggests that higher levels of exports have contributed to improving Indonesia's balance of trade from 2010 to 2022. Conversely, the import variable has shown a significant negative impact on the balance of trade over both the long term and short term. This indicates that increased imports have contributed to a decrease in Indonesia's balance of trade during the same period.

The research findings indicate that the foreign direct investment (FDI) variable has a positive yet statistically insignificant impact on Indonesia's balance of trade in the long term. However, in the short term, the FDI variable shows a significant negative impact on the balance of trade. This suggests that while an increase in FDI may enhance Indonesia's balance of trade over the period from 2010 to 2022 in the long run, it adversely affects the balance of trade in the short term during the same period. Similarly, the exchange rate has been observed to have a positive but not significant impact on Indonesia's balance of trade in both the long term and short term. This indicates that an increase in the exchange rate may positively influence Indonesia's balance of trade from 2010 to 2022, albeit without statistical significance. Overall, the variables of export, import, foreign direct investment (FDI), and exchange rate collectively exert a significant impact on Indonesia's balance of trade during the period under study..

A suggestion that can be conveyed to the government as input is that to maintain the stability of Indonesia's balance of trade position, the government needs to set clear targets and take concrete actions through policies that encourage an improvement in the balance of trade, both through policies related to the variables used in this study and other variables outside of this study.

High export activities will drive a surplus in the current account balance, so the government needs to establish wiser export policies. To support this increase in exports, the government can engage in more extensive downstream processing, so that exported products from Indonesia are not only sold as raw materials. Additionally, high import activities increase the likelihood of a deficit in the current account balance. To address this, the government needs to establish policies to reduce or restrict imports, which can be done through tariff barriers, import quota restrictions, or even import bans on certain products that have a negative impact on the livelihoods of the people.

Through increasing the flow of foreign direct investment (FDI), the government must develop policies that are appropriate for channeling FDI into productive sectors and oriented towards exports rather than consumption sectors. Optimization policies aimed at promoting investment that can generate export goods can also be implemented. On the other hand, to increase the surplus in Indonesia's balance of trade, the government must strive to control the stability of the rupiah exchange rate against other currencies, especially the US dollar, partly through policies to increase exports. Although the depreciation of the rupiah exchange rate can enhance the competitiveness of domestic products abroad, it can also lead to price increases domestically, which can impact the economy, so it must be done carefully.

7. References

- Adiastuti, A. (2011). Implementasi Foreign Direct Investment (FDI) di Indonesia (Sebelum dan Setelah diundangkannya Undang-Undang Nomor 25 Tahun 2007 Tentang Penanaman Modal). *Pardecta: Research Law Journal*, 6(2), 139–149. <https://doi.org/10.15294/pardecta.v6i2.2332>
- Ali, A., & Audi, M. (2023). Analyzing the Impact of Foreign Capital Inflows on the Current Account Balance in Developing Economies: A Panel Data Approach. *Journal of Applied Economic Sciences (JAES)*, 18(2), 92–107. [https://doi.org/10.57017/jaes.v18.2\(80\).04](https://doi.org/10.57017/jaes.v18.2(80).04)

- AntaraNews. (2013). *Ekspor Merosot, Impor Membengkak Tahun 2012*. Antara News. Diakses pada 12 Desember 2023. <https://www.antaranews.com/berita/356127/ekspor-merosot-impor-membengkak-tahun-2012#mobile-nav>
- Bacovic, M., Jacimovic, D., & Smolovic, J. C. (2020). Impact of Export of Travel Services on Current Account Balance and Growth in Mediterranean Countries. *Prague Economic Papers*, 29(6), 710–728. <https://doi.org/10.18267/j.pep.748>
- Bagaskoro, M. N. (2019). Effect of Export Transactions During and After the Current Indonesian Subprime Mortgage. *Jurnal Ecoplan*, 2(1), 21–32. <https://doi.org/10.20527/ecoplan.v2i1.15>
- Bank Indonesia. (2023). *Statistik Ekonomi dan Keuangan Indonesia*. Jakarta: Bank Indonesia. Diakses pada 24 Oktober 2023. <https://www.bi.go.id/id/statistik/ekonomi-keuangan/seki/Default.aspx#headingFour>
- Das, S., & Chatterjee, S. (2011). Multicollinearity Problem-Root Cause, Diagnostics and Way Outs. *SSRN Electronic Journal*, 18(2), 1–17. <https://doi.org/10.2139/ssrn.1830043>
- Dornbusch, R., Fischer, S., & Mulyadi, J. A. (2011). *Makroekonomi* (Bahasa Indonesia). Jakarta: Erlangga.
- Firdaus, R., & Ariyanti, M. (2011). *Pengantar Teori Moneter Serta Aplikasinya Pada Sistem Ekonomi Konvensional Dan Syariah*. Bandung: Alfabeta.
- Gardasevic, A. (2013). The Influence of Foreign Direct Investments on Montenegro Payment Balance. *UTMS Journal of Economics*, 4(3), 283–294. <https://www.utmsjoe.mk/past-issues/2-uncategorised/22-vol-4-no-3>
- Gujarati, D. N. (2015). *Dasar-Dasar Ekonometrika* (5th Edition). Jakarta: Salemba Empat.
- Hariyani, I., & Serfianto. (2010). *Parduan Ekspor Impor*. Yogyakarta: Penerbit Pustaka Yustisia.
- Hasanah, L., & Viphindartin, S. (2015). Hubungan Kausalitas Antara FDI dan Neraca Transaksi Berjalan di Indonesia Periode 2000.I-2013.IV. *Karya Ilmiah Civitas Akademika Program Studi Ekonomi Pembangunan Tahun 2015*, 1–10. <http://repository.unej.ac.id/handle/123456789/75101>
- Juanda, B., & Junaidi. (2012). *Ekonometrika Deret Waktu Teori dan Aplikasi*. Bogor: IPB Press.
- Kementerian Perdagangan. (2023). *Satu Data Perdagangan*. Kementerian Perdagangan. Diakses pada 24 Oktober 2023. <https://satudata.kemendag.go.id/data-informasi/perdagangan-dalam-negeri/nilai-tukar>
- kompas.com. (2016). *Investasi AS dan Inggris di Indonesia Merosot, Ini Penyebabnya*. Kompas.Com. Diakses pada 13 Desember 2023. <https://money.kompas.com/read/2016/10/25/2016/31226/investasi.as.dan.inggris.di.in-donesia.merosot.ini.penyebabnya>
- kompas.id. (2023). *Nilai Tukar Rupiah 2022 Melemah 9,31 Persen*. Kompas.Id. Diakses pada 13 Desember 2023. <https://www.kompas.id/baca/ekonomi/2023/01/01/nilai-tukar-rupiah-2022-melemah-931-persen>
- Krugman. (2015). *Ekonomi Internasional Teori dan Kebijakan Jilid 2* (Edisi 5). Jakarta: PT Indeks Kelompok Gramedia.

- Lapian, M., Rotinsulu, T. O., & Wauran, P. C. (2018). Analisis Faktor-Faktor yang Mempengaruhi Neraca Transaksi Berjalan di Indonesia Periode 2010:Q1-2017:Q4. *Jurnal Berkala Ilmiah Efisiensi*, 18(02), 193–203. <https://ejournal.unsrat.ac.id/v3/index.php/jbie/article/view/20126>
- Madura, J. (2011). *Keuangan Perusahaan Internasional 1* (Edisi 8). Jakarta: Salemba Empat.
- Mankiw, N. G. (2012). *Pengantar Teori Ekonomi Makro* (Edisi Ketiga). Jakarta: Salemba Empat.
- Marpaung, E. (2013). Pengaruh Nilai Tukar Riil Terhadap Trade Balance di Negara ASEAN. *Economics Development Analysis Journal*, 2(3), 46–60. <https://doi.org/10.15294/edaj.v2i3.1977>
- Muelgini, Y., Awaluddin, I., & Khoirunnisa, D. (2020). Analisis Neraca Transaksi Berjalan di Indonesia: Pendekatan Mundell-Fleming. In *Repository LPPM*. Universitas Lampung.
- Murni, A. (2013). *Ekonomika Makro*. Edisi Revisi. Bandung: PT Refika Aditama.
- Nanga, M. (2009). *Makro Ekonomi: Teori, Masalah, dan Kebijakan*. Jakarta: PT Raja Grafindo Persada.
- Nizar, M. A. (2013). Pengaruh Defisit Anggaran Terhadap Defisit Transaksi Berjalan di Indonesia. *Working Paper*. Jakarta: Badan Kebijakan Fiskal.
- Nopirin. (2010). *Ekonomi Internasional*. Edisi 3. Yogyakarta. BPFE.
- Nopirin. (2016). *Ekonomi Moneter* (Edisi II). Yogyakarta: BPFE.
- Noraditha, Y., Heriberta, H., & Emilia, E. (2021). Analisis Variabel yang Mempengaruhi Kinerja Neraca Transaksi Berjalan Indonesia Periode 2006-2020. *E-Journal Perdagangan Industri Dan Moneter*, 10(1), 51–62. <https://doi.org/10.22437/pim.v10i1.15846>
- Pramudya, B. A. (2020). *Determinan Neraca Transaksi Berjalan Indonesia Tahun 1987-2019*. Skripsi thesis. Universitas Muhammadiyah Surakarta.
- Purwono, R., Mucha, K., & Mubin, M. K. (2018). The Dynamics of Indonesia's Current Account Deficit: Analysis of the Impact of Exchange Rate Volatility. *Journal of Asian Finance, Economics and Business*, 5(2), 25–33. <https://doi.org/10.13106/jafeb.2018.vol5.no2.25>
- Reksoprayitno, S. (2015). *Pengantar Ekonomi Makro* (Edisi Keenam). Yogyakarta: BPFE.
- Samuelson, P. A., & Nordhaus, W. D. (2009). *Makroekonomi* (Edisi 14). Jakarta: Penerbit Erlangga.
- Saputra, E. G., & Indrawati, L. R. (2022). Pengaruh Ekspor, Cadangan Devisa, Inflasi Terhadap Transaksi Berjalan di Indonesia dan Singapura 2000-2019. *Jurnal Paradigma Multidisipliner (JPM)*, 3(1), 33–41. <https://doi.org/10.1210/v3i1.152>
- Sari, I. G. (2021). *Analisis Faktor-Faktor yang Mempengaruhi Neraca Transaksi Berjalan di Indonesia Periode 1990 – 2018*. Skripsi thesis. Universitas Muhammadiyah Surakarta.
- Sasmiranti, Y., Iman, A. H., & Nurjihadi, M. (2018). The Effect of Productivity on Current Account in ASEAN Countries within 1995-2015. *Jurnal Ekonomi Dan Bisnis Indonesia*, 3(2), 1–7. <https://doi.org/10.37673/jebi.v3i2.380>

- Sugiyono. (2013). *Metodologi Penelitian Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabeta CV.
- Sujit, K. S., Kumar, B. R., & Oberoi, S. S. (2020). Impact of Macroeconomic, Governance and Risk Factors on FDI Intensity—An Empirical Analysis. *Journal of Risk and Financial Management*, 13(12), 1–14. <https://doi.org/10.3390/jrfm13120304>
- Sukirno, S. (2011). *Teori Pengantar Makro Ekonomi*. Jakarta: PT Raja Grafindo Persada.
- Susilo, A. (2013). *Parduan Pintar Ekspor Impor*. Jakarta: TransMedia.
- Tambunan, T. (2012). *Perdagangan Internasional dan Neraca Pembayaran*. Jakarta: Pustaka LP3ES.
- Tardjung, M. (2011). *Aspek dan Prosedur Ekspor-Impor*. Jakarta: Salemba Empat.
- Tobing, L, Soekarto, S.R., Cahyono, W., & Widodo, T. (2013). Sustainability Defisit Transaksi Berjalan: Pembiayaan Melalui Transaksi Modal dan Finansial. *Working Paper*. Jakarta: Bank Indonesia.
- Tomayahu, N. A., Kumaat, R. J., & Mardeij, D. (2021). Analisis Pegaaruh Nilai Tukar, PDB Tiongkok, dan Foreign Direct Investment (FDI) Terhadap Neraca Perdagangan di Indonesia (2000-2019). *Jurnal EMBA*, 9(1), 1291–1300. <https://doi.org/10.35794/emba.v9i1.32987>
- Wairooy, F. A., & Endraswati, H. (2023). The Effect of Foreign Direct Investment (FDI), Investment Portofolio, Exchange Rate, and Inflation on Current Account Balance (CAB) with Corruption Perception Index (CPI) as a Moderation Variable for the Period 1995-2022 in ASEAN-6. *Business Management Analysis Journal (BMAJ)*, 6(2), 148–168. <https://doi.org/10.24176/bmaj.v6i2.10846>
- Widarjono, A. (2018). *Ekonometrika Pengantar Dan Aplikasinya Disertai Parduan Eviews* (Edisi Kelima). Yogyakarta: UPP STIM YKPN.
- Wijaya, E. (2019). Kondisi Makroekonomi Sebagai Faktor yang Mempengaruhi Neraca Transaksi Berjalan Periode 1999-2016. *Ekspansi: Jurnal Ekonomi, Keuangan, Perbankan Dan Akuntansi*, 11(1), 87–100. <https://doi.org/10.35313/ekspansi.v11i1.1247>
- Wiryanti, T. (2017). Korelasi Ekspor dan Impor Terhadap Neraca Perdagangan dan Neraca Pembayaran di Indonesia Tahun 2007-2016. *Jurnal Bisnis & Akuntansi Unsurya*, 2(1), 36–48. <https://doi.org/10.35968/jbau.v2i1.167>