

Analysis of The Effect of Inflation on Indonesia's Trade Balance

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Abstract. Inflation is one of the economic indicators that can affect a country's trade balance. This study aims to analyze the effect of inflation on Indonesia's trade balance in the 2019-2024 period using monthly data obtained from Bank Indonesia (BI) and the Central Statistics Agency (BPS). The method used in this research is simple linear regression analysis. Classical assumption testing includes normality, heteroscedasticity, and autocorrelation tests to ensure the validity of the model. The results showed that inflation has a positive, but insignificant relationship with Indonesia's trade balance. The coefficient of determination (R^2) value of 0.001 indicates that the inflation variable only explains a small part of the variability of the trade balance, while other variables are more dominant. This finding provides insight that the effect of inflation on the trade balance is weak, so a more in-depth study of other variables that affect the performance of the trade balance is needed.

Keywords: Inflation; Indonesia's Trade Balance; Economic Analysisism

INTRODUCTION

In the current era of globalization, on average, every country conducts international trade. The state of the global economy also follows the development of the country's economy. With the opening of a country's economy, the situation and trends of the world economy as a whole will definitely have an impact on the economy of a country, including Indonesia. Today, no country is isolated without economic relations with other countries. This situation causes competitiveness to become one of the main triggers, so that countries benefit from the openness of the world economy (Puri & Ima Amaliah, 2021). A country's international trade activities with other countries are recorded in the trade balance.

Trade Balance is a record or overview that contains or records all details of a country's export and import transactions or details of profit and loss in a certain period or records the difference between the value of export transactions and import transactions in a country in a certain period. In the long run, the condition of the balance of trade shows the role of each country concerned in international trade. The trade balance is also an important part of the balance of payments that records payments from one country to another.

The trade balance reflects the state of the economy of a country. If the value of the trade balance in a country is a surplus, then the country is classified as an exporter country, where exports exceed the number of imports. Then if the trade balance is in deficit, then the country is classified as an importer country. For developing countries, a deficit in the trade balance has an unfavorable and detrimental impact because the costs incurred for imports are higher than export revenues, so that it can reduce the ability of a country to improve the welfare of the population and can put and bring a country into a state of crisis.



Source : BPS : 2024

Indonesia's trade balance showed very dynamic changes from 2019 to 2024. The trade balance recorded a deficit in 2019-2020, where in 2019, Indonesia again experienced a deficit caused by the high size of the oil and gas deficit and the decline in the non-oil and gas surplus but has gradually improved since then. Although the improvement has not been significant, it shows that export performance is gradually outpacing import performance.

In 2020 to 2022, the trade balance shows a very strong upward trend. The surplus will peak in 2022, reflecting Indonesia's success in maintaining a very strong export performance compared to import growth. This situation can be influenced by various factors, including increasing global demand for Indonesia's main export products and trade policies that successfully encourage export activities.

The trade surplus in this period will peak in 2022, which shows Indonesia's success in maintaining economic stability amid global challenges. However, the trade balance peaks in 2022 and starts to decline gradually. The previously high surplus will decline gradually in 2023 to 2024. This decline suggests that trade performance may come under pressure from various factors, including reduced global export demand, supply chain disruptions, and increased imports due to rising domestic demand. However, Indonesia's trade balance in the period remained in surplus and did not return to deficit.

Overall, the development of Indonesia's trade balance in 2019 to 2024 reflects economic trends influenced by various domestic and global factors. While initially showing good results, with an increasing surplus trend until 2022, it eventually faced challenges that led to a decline in surplus over the last two years. This highlights the importance of adaptive strategies to maintain trade balance, especially in the face of changing global conditions.

Domestic pricing is affected by inflation. Mankiw asserts that inflation is, after all, an increase in the overall price level. (Sitompul & Siahaan, 2020). The indication used for inflation is the statistical Consumer Price Index (CPI) which is often used to calculate the inflation rate. The CPI fluctuates over time, reflecting changes in the cost of publicly packaged products and services. The Cost of Living Survey (CBS) and the Central Bureau of Statistics (BPS) are used to determine the items to be included in the CPI basket. Then, BPS will track monthly price changes for those products and services in a number of traditional

and contemporary markets in several cities for various goods and services (Sitompul & Siahaan, 2020).

Dornbusch et al. (2008:39) stated that "Inflation is the rate of change in prices, and the price level is the cumulation of past inflations". This means that inflation is the rate of change in prices, and the price level is the accumulation of past inflations. The tendency of rising prices (inflation) will affect exports. When prices tend to rise, the cost of production factors increases significantly. This will affect the prices of goods and services produced and potentially even increase prices. On the other hand, in the short term, the level of income may not necessarily keep up with the prices or services produced, and even if there is an increase, the level of income is not proportional to the increase in prices (inflation). Inflation can also increase the cost of exported goods which results in a decrease in exports (Puri & Ima Amaliah, 2021). Therefore, a country's inflation can affect its export and import activities.

The exchange rate against foreign currencies is a sign of the strength of a country's currency. The exchange rate is determined by the need (demand) and availability (supply) between currencies in each country. The depreciation or appreciation of a country's exchange rate depends on the availability of the currency. Foreign exchange rates are significantly affected by inflation. When inflation is prevalent, exchange rates usually tend to depreciate.

Literature Review And Proposition/Hypothesis Formulation

Trade Balance

The trade balance is a component of the current account that measures net trade in merchandise, which is the difference between the value of exports and imports of merchandise. The trade balance, also known as the net export balance, is the difference between the exports and imports of an economy during a certain period of time in a year measured using legal currency (Sitompul & Siahaan, 2020).

The trade balance is an overview that shows the difference in the value of export and import transactions in a country within a certain period of time. The trade balance can also be interpreted as a report that shows the comparison of the value of exports and imports of a country in a certain period of the year, expressed in the prevailing currency. To calculate the trade balance, the components are as follows.

$$\text{Balance of Trade} = \text{Exports} - \text{Imports}$$

When the value of exports exceeds the value of imports, the trade balance indicator which is a positive balance creates a trade surplus. If the reverse is true, the balance is negative then this is called a trade deficit. Analysis of a country's economic performance and trade patterns as reflected in its product trade are both provided by the trade balance (Asnawi & Hasniati, 2018).

There are three types of trade balance, namely:

a. **Surplus Trade Balance**

This is a condition where when the value of export transactions is much greater than the value of imports. When a country's trade balance shows a surplus, this indicates a favorable condition because the country's income from international trade is higher. To keep the trade balance in surplus, the country needs to optimally control the value of exports and imports.

b. **Deficit Trade Balance**

The trade balance will be in deficit if the value of imports is greater than the value of exports. This condition is considered unfavorable, especially for developing countries, because spending on imports exceeds income from exports.

c. **Balanced Trade Balance**

A balanced trade balance occurs when the value of exports equals the value of imports, indicating that the country has neither a profit nor a loss in international trade. However, maintaining a balanced trade balance can be challenging for some countries.

Exports

Exports are international trade activities that provide a stimulus to grow domestic demand that leads to the emergence of large manufacturing industries, along with a stable positive structure and efficient social institutions (Todaro, 2000).

Exports are one sector of the economy that plays an important role and through the expansion of the industrial sector market will encourage other industrial sectors and the economy (Meier, 1996).

Import

Import is the activity of entering goods into the customs territory carried out by individuals or legal entities. Goods transported across national borders are required to fulfill customs provisions, such as payment of import duties and applicable import taxes (Indriyani, 2015).

Inflation

Inflation is one of the variables that affect trade. According to Gede, Setyarti, Astini and Aniyati (2017), inflation is the tendency of an increase in the prices of goods in general that takes place in a long period of time. Raharja and Manurung (2006) define inflation as a general and sustained increase in the prices of goods, while Berlianta (2005) states that the inflation rate is usually expressed in annual percentages.

Inflation reflects an economic condition in which there is a tendency for the prices of goods and services to rise continuously due to an imbalance between the amount of money in circulation and the amount of goods in a region (Nurseptiawan & Nuryadin, 2023). According to Hamimah (2021), inflation is a symptom of rising prices of goods that take place generally and continuously. Some other experts consider that inflation occurs when price increases are comprehensive and sustained. Inflation has a significant impact on exchange rates.

High inflation tends to weaken the exchange rate. In addition, inflation causes domestic prices to be higher than prices abroad, which in turn can increase imports and suppress exports, potentially leading to a trade deficit (Puri & Amaliah, 2021).

Previous Research

Research on inflation and trade balance has been conducted by previous research presented in national research, which includes:

1. Fakhruddin & Surya Rahmawati (2021) examined "PENGARUH INFLASI DAN PERGERAKAN NILAI TUKAR RUPIAH TERHADAP NERACA PERDAGANGAN INDONESIA" with the results that inflation has a negative and significant effect on the trade balance, because an increase in inflation causes the price of domestic goods to increase, while the price of foreign goods tends to remain fixed. This considerable price difference makes consumers more likely to choose imported products than

domestic products. As a result, imports will increase, which can depress the trade balance and potentially cause a deficit if the increase in exports is not able to compensate.

2. Ilham Tri Murdo & Junaidi Affan (2021) examined "Pengaruh PDB, Inflasi, Kurs Dan Tingkat Suku Bunga Terhadap Neraca Perdagangan Indonesia" with the results of the hypothesis test that H_0 is rejected and H_a is accepted, meaning that there is a negative and significant effect of inflation on the Trade Balance, this is in line with research conducted by Wibowo (2021). If there is inflation, prices will increase, as a result the demand for goods and services will tend to decrease because the increase in prices is not followed by a balanced increase in income. The impact is that the goods and services produced are oversupplied, if inflation continues the tendency of producers to reduce production, apart from a decrease in demand due to rising prices, on the other hand there is also an increase in raw materials. As a result of reduced production, the number of exported goods will also decrease. If the assumption of imports remains and exports have decreased, the balance of trade will decrease and there could even be a trade deficit.
3. Syamsul Allim Syah Habibi (2023) examines "Analisis Pengaruh Inflasi dan Kurs Rupiah Terhadap Neraca Perdagangan di Jawa Barat (Tahun 2013-2022)" with the results of inflation having a negative and insignificant effect on the dependent variable trade balance in West Java vulnerable time from 2013-2022, this means that the increase in prices of goods in general in the province of West Java does not result in exporters and importers reducing and continuing to carry out buying and selling transactions so that the trade balance will continue to be constant.
4. Novi Ariani & Ima Amaliah (2023) examined "Pengaruh Pertumbuhan Ekonomi, Inflasi, dan Nilai Tukar Terhadap Neraca Perdagangan Indonesia-China" with the results of inflation having a positive and insignificant effect in the short and long term on Indonesia's trade balance with China. The magnitude of the influence of economic growth variables in the short term is seen from the coefficient of negative 1505.898. This means that when economic growth increases by 1%, Indonesia's trade balance with China decreases by 1505.898 million USD.
5. Nancy Nopeline & Maria Fransiska Siahaan (2020) examined "ANALISIS PENGARUH NILAI TUKAR DAN INFLASI TERHADAP NERACA PERDAGANGAN DI INDONESIA 2008 – 2018" with the result that there is a significant negative relationship between inflation and the trade balance. An increasing inflation rate will slow down the economy and hinder the productivity of producers to produce due to the increasing inflation rate. Especially if it is followed by some of the raw materials for our goods are still imported. This import activity will also have an impact on the trade balance deficit. High imports can mean a high need for foreign currency. So that if production slows down due to imported raw materials experiencing inflation so that domestic prices will also increase and be followed by weakening people's purchasing power. Meanwhile, if we want to increase exports, we must increase production. This will reduce production which will lead to reduced exports.
6. Shalihah Dwi Adini & Rachmat Pramukty (2023) examined "Faktor-Faktor Yang Mempengaruhi Neraca Perdagangan" with the results of inflation having an impact on the trade balance through its effect on foreign exchange rates, where inflation is closely related to exchange rates. The exchange rate tends to weaken when inflation increases, thus affecting the prices of domestic and foreign goods in the context of

export-import trade. In economic theory, other related factors also have a significant influence on trade performance, particularly in terms of imports and exports.

7. Nenden Yushinta Puri & Ima Amaliah (2021) examined "Pengaruh Inflasi, Suku Bunga, PDB, Nilai Tukar dan Krisis Ekonomi terhadap Neraca Perdagangan Indonesia Periode 1995-2017" with the results of estimating the trade balance model in Indonesia identified that all independent variables, namely inflation, interest rates, GDP, exchange rates and trade balance partially significantly affect the trade balance in Indonesia. The relationship between the dependent and independent variables is in accordance with the hypothesis built at the beginning. The variable that has the greatest influence on the trade balance in Indonesia is the exchange rate followed by the economic crisis.
8. Muh Agung Permana, Herman Sjahrudin, Reni Satriani, Indrawati Indrawati, Muhammad Arfandi A. Caronge, Arwinni Ratu M6 (2023) examined "MENELISIK NERACA PERDAAGANGAN INDONESIA DARI FAKTOR INFLASI DAN KURS" with the results of the study, it can be concluded that the inflation variable has a negative and insignificant relationship to the trade balance, if there is inflation in a country, and if it is not followed by a significant increase in income, it causes purchasing power to decrease, public consumption decreases, demand decreases, as a result, goods and services on the market that are purchased become less, if this continues, producers will reduce production, goods and services on the market are reduced, the impact on exports is also reduced, exports decrease, and if the import assumption remains, the trade balance decreases and can even be in deficit.

Research Gaps

Based on previous research on the effect of inflation on the trade balance, most studies show a negative relationship between inflation and the trade balance. Research conducted by Fakhrudin & Rahmawati (2012), Ilham Tri Murdo & Junaidi Afnan (2021), Nancy Nopeline & Maria Fransiska Siahaan (2020) and Muh Agung Permana, Herman Sjahrudin, Reni Satriani, Indrawati Indrawati, Muhammad Arfandi A. Caronge, Arwinni Ratu M6 (2023) found that inflation has a negative and significant effect on the trade balance. This result shows that an increase in inflation tends to cause a decrease in exports and an increase in imports, thus worsening the trade balance.

However, a different result was found by Syamsul Allim Syah Habibi (2023), where inflation has a negative but insignificant effect on the trade balance. This suggests that inflation does not directly affect export-import activities in the analyzed period. On the other hand, research by Novi Ariani & Ima Amaliah (2023) even found that inflation has a positive but insignificant effect on the trade balance, indicating that rising inflation does not always have a negative impact on the trade balance.

Hypothesis Formulation

Based on the research gaps that have been identified, there are inconsistent results regarding the effect of inflation on the trade balance, both in terms of the direction of the relationship (positive or negative) and its significance. The hypotheses in this study are formulated as follows:

1. Null Hypothesis (H_0): inflation has no significant effect on Indonesia's trade balance.
2. Alternative Hypothesis (H_1): Inflation has a significant influence on Indonesia's trade balance.

In addition, to further detail the direction of the relationship, specific hypotheses are formulated as follows:

- H_{1a} : Inflation has a negative effect on Indonesia's trade balance.
- H_{1b} : Inflation has a positive effect on Indonesia's trade balance.

METHOD

Population and Sample

According to Sudjana (2006), population includes all elements or members that are the subject of measurement, both quantitatively and qualitatively, with certain characteristics that are complete and relevant to research. In this study, the population used consists of monthly data on inflation and Indonesia's trade balance from 2019 to 2024.

Arikunto (1996) states that the sample is some elements of the population chosen to represent the whole. The sample is used so that the research results can describe the population in general. This study uses all population data, namely monthly data for 6 years, resulting in 72 observations.

Operational Definition of Variables

The operational definition of variables aims to provide a clear explanation of the variables used in this study, as well as how each variable is measured and analyzed. In this study, there are two main variables, namely:

1. Dependent Variable (Y): Trade Balance

Trade balance is the difference between the value of exports and imports of merchandise of a country in a certain period. A positive value indicates a trade surplus, while a negative value indicates a trade deficit.

Unit of Measurement: Millions of United States Dollars (USD).

Indicator:

- Total value of exports (in USD) in a period.
- The total value of imports (in USD) in the same period.
- Calculation formula: Trade Balance = Exports – Imports

2. Independent Variable (X): Inflation

Inflation is the percentage increase in the general price level of goods and services within a certain period, which reflects a decrease in the purchasing power of money. Inflation is measured using the Consumer Price Index (CPI).

Unit of Measurement: Percentage (%) change in CPI from month to month.

Indicator:

- Consumer Price Index (CPI): Shows the average change in prices of goods and services consumed by households.
- Formula for calculating monthly inflation:
$$\text{Inflation (\%)} = \frac{IHK_t - IHK_{t-1}}{IHK_{t-1}}$$

Data Collection Method

Based on the data required and used, the collection method used for this research is through literature study and documentation research methods. Literature study includes searching online scientific journals to understand the theory, previous research results, and research gaps. And documentation includes downloading quantitative data from the official website of Bank Indonesia (BI), namely bi.go.id and the Central Statistics Agency (BPS), namely bps.go.id.

RESULTS AND DISCUSSION

Descriptive Statistics

Based on the results of data processing that the Inflation variable (X) is described that the minimum value is 0.00 while the maximum value is 132.00 with an average monthly of 4.5556. And the standard deviation of Inflation data is 15.39237. And for the Indonesian Trade Balance variable shows that the minimum value is -2331.10 while the maximum value is 7558.80 with an average of 2350.3472 and a standard deviation of 1984.53318.

Classical Assumptiion Testing Method

1. Normality Test

The test criteria using Kolmogorov-Smirnov are if the significance value is smaller than 0.05, the data is not normal and vice versa if the significance value is greater than 0.05, the data is said to be normal. Based on the results of data processing, the Kolmogorov-Smirnov significance of 0.200 is greater than 0.05 so that the data can be said to be normal or meet the normality assumption test.

2. Multicollinearity Test

The Viarance Inflation Factor (VIP) value for the independent variable, namely Inflation, is less than 10 and the tolerance is greater than 0.1 or 1.000, indicating that there are no multicollinearity symptoms.

3. Heteroscedasticity Test

The significance value of the independent variable, namely Inflation of 0.422, is greater than 0.05. Thus it can be concluded that in this regression model there is no heteroscedasticity.

4. Autocorrelation Test

The autocorrelation test was carried out with the Durbin Waston (DW) mapping test and obtained a DW number of 0.739. With the amount of data (n) as much as 72 and the number of independent variables (k) as much as 1, the numbers $dL = 1.5895$ and $dU = 1.6457$ are obtained.

Simple Linear Regression

Based on the simple linear regression performed, the linear regression equation formed is:

$$Y = 2314.386 (\alpha) + 3.042 (X) + e$$

From the simple linear regression equation above, it can be analyzed as follows:

- Constant (α) is 2314.386. This means that if Inflation is fixed, then the Indonesian Trade Balance is 2314.386.
- Regression direction coefficient / β (X) of 3.042 (positive value). This means that if Inflation increases by one (1) unit, the Indonesian Trade Balance will also increase by 3.042.

1. F Test / Model Suitability

Based on the results of data processing, the calculated F value of 0.38 is smaller than the F table value of 3.98 with a significance level of 0.846 greater than α 0.05. So it can be concluded that the model is not suitable.

2. Hypothesis Testing

Based on the data processing conducted, the t-count value of 0.196 is smaller than the t-table of 1.66691 and the probability value of 0.846 is greater than α 0.05. This shows

that the Inflation variable does not significantly affect the Indonesian Trade Balance variable.

3. Coefficient of Determination

Based on the results of data processing, the R square value of 0.001 means that Inflation affects the Indonesian Trade Balance by 0.01% while the remaining 99.9% is influenced by other factors outside the model.

CONCLUSION

The conclusion of this study shows that Inflation has no significant effect on Indonesia's Trade Balance during the 2019-2024 period. The positive regression coefficient value indicates a unidirectional relationship, but the significance greater than 0.05 ($\alpha = 5\%$) indicates that the effect of inflation on the trade balance is weak or insignificant. This suggests that fluctuations in inflation during the period did not directly affect the performance of the trade balance. In addition, the low value of the coefficient of determination (R^2) of 0.001 indicates that the inflation variable only explains a small part of the variability of the trade balance, while other factors outside inflation are more dominant in influencing the trade balance.

And the author's suggestion is that the government needs to strengthen export product diversification, increase the added value of local products, and expand market share in export destination countries to reduce dependence on imports and improve the trade balance. As well as further research is expected to expand data coverage, use a longer time period, and consider the influence of other relevant variables, such as trade and stable policies. Given that inflation is not a significant factor in affecting the trade balance based on the results of this study, the government and policymakers should pay attention to other factors, such as exchange rates, interest rates, international trade policies, or the export-import performance of strategic sectors. Further research can also explore these variables.

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