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Research Article

The Effect of The Exchange Rate on The Indonesian Trade Balance in The Managed Floating Exchange Rate System and Flexible Exchange Rate System (Period 1980 to 2020)

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Abstract

The aim of this research is to look at the impact of the exchange rate on Indonesia's trade balance in the short term and long term during the controlled/managed floating exchange rate system and the floating/flexible exchange rate system, as well as to see if there are any differences between the controlled/managed floating exchange rate system and the floating/flexible exchange rate system. This study uses times series data for the period 1980 - 2020 by including dummy variables. The first stage is to test the data stationarity with the unit root test and the results are mostly stationary data at the first difference. Furthermore, based on the results of the cointegration test, it turns out that there has been cointegration between variables so that to see the balance of the regression model both in the short and long term, the error correction model (ECM) is used, and the results show that in the short-term using a floating exchange rate system the exchange rate affects the foreign trade balance, while with a controlled floating exchange rate system the exchange rate affects the foreign trade balance. Meanwhile, in the long term using a floating exchange rate system, the exchange rate affects the foreign trade balance, while in a controlled floating exchange rate system the exchange rate does not affect the foreign trade balance. Other results show that there is a difference in the average trade balance variable during the floating system with managed/controlled floating only for the export price index and economic growth.

Keywords

Exchange rate, trade balance, flexible exchange rate system, managed floating exchange rate system, error correction model

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Introduction

In theory, the depreciation of the exchange rate will improve the position of the trade balance, because it will increase the price of imports so that the demand for imported products will decrease, the value of imports will decrease, on the other hand, export prices will decrease, so that the demand for export products increases, the value of exports will also increase. This condition will affect the position of the foreign trade balance and foreign balance of payments of a country. Starting from this theory, it has caused a lot of attention from both academics and policy makers to always observe how fluctuations in exchange rates will affect the position of foreign trade transactions.

The decrease in services and merchandise trade (trade balance) is the main component of Indonesia's significant current account deficit. Over the last ten years, the trade balance has deteriorated as a result of stagnant exports and increasing imports. Two approaches to changing the country's competitiveness are available to the authorities in order to improve the trade balance. The internal strategy is based on supply-side policies such as inflation, interest rates, export and import prices, and economic growth. The external approach, on the other hand, consists of devaluing/depreciating the currency. Supporters of nominal exchange rate depreciation are on one side of the trade balance decrease, while supporters of exchange rate system policy are on the other. However, no formal quantitative estimate of the long term and short run effects of exchange rate changes on foreign trade balance has been published.

For a variety of reasons, quantifying the short term and long run responsiveness of exchange rate changes to foreign trade position is critical for economic policy. To begin, it determines whether the exchange rate and trade balance have a long-term stable relationship. If such a long-term stable relationship does not exist, depreciating the currency does not appear to be a viable long-term strategy for improving the country's competitiveness. Second, if a long run relationship exists, it must be determined whether depreciation is likely to result in a long-term net incourage in the foreign trade position. Third, quantifying the extent of trade balance improvement would be desirable because it is expected to benefit from an increase in foreign trade positions for permanent depreciation costs (Stucka, 2004).

The short run dynamics estimate provides information on the short- and medium run effects of exchange rate changes on trade balance. The question here is whether depreciation has a negative impact on the trade balance in the short run. If this is the case, it appears reasonable to estimate the duration and magnitude of the negative effect. The findings presented here may help to improve understanding of the international transmission of changes in economic activity and prices. (Tarr et al., 2021).

In a broader sense, the estimates may provide some insight into soreanding cutting policies impact, both fiscal and monetary, on the domestic trade balance. It may encourage more research into the effects of large government foreign lending on the trade balance and the current account in general. The findings could be used to compare the appropriateness of an asymmetric central bank intervention policy to an alternative, such as the implementation of a crawling-peg exchange rate policy to support a permanent depreciation of the domestic currency (Liu, Zhu, & Wang, 2021).

Other factors besides the exchange rate which in theory can affect the trade balance are inflation (Choi, 2017), high inflation in a country indicates an increase in prices for almost all goods, this causes the production cost of export goods to be expensive and exports will rise, an increase in export prices will reduce the demand for export goods and in the end will reduce the value of exports. Due to the high price of domestic goods, people will switch to imported products so that the demand for imported products will increase. With inflation the value of exports decreases while the value of imports will increase so the foregin trade position will decrease.

Prices of export products and prices of imported products will also affect the trade balance, when the price of export products is high it will tend to reduce demand for export products, so that the trade balance will fall. The rising price of imported products will tend to reduce the demand for imported products so that the trade balance will decrease (Akorli, 2017).

Economic growth is another factor that is also able to affect the trade balance, when there is an increase in economic growth causing the ability to buy imported products to increase, if it is not balanced with an increase in export demand it will reduce the position of the trade balance value (Akorli, 2017).

In general, the movement of Indonesia's trade balance from 2000 to 2020 showed a downward

trend. The crisis that occurred in 2008 showed its effect on Indonesia's trade balance. The crisis was initiated by too fast economic development in the United States, where a large accumulation of credit in a short time caused economic instability and led to a global crisis (Bolarinwa, Adegboye, & Vo, 2021). With the interconnectedness of the economy, the crisis that occurred quickly spread to other countries, including Indonesia. Indonesia was the country that felt the least impact of the crisis at that time because of the small proportion of Indonesia's exports in Gross Domestic Product. Indonesia's trade balance during this period decreased by 80.26% compared to the previous period. This was also driven by, among other things, an increase in imports of 73.48% during the year, which was dominated by gas and non-oil imports. At that time, gas and non-oil imports increased by 87.75% compared to the previous period and became a major pressure on Indonesia's foreign trade position at that time.

Entering 2012, Indonesia's trade balance, which is currently recovering, is facing great pressure. For the first time since 1961, Indonesia's trade balance recorded a deficit. The weakening international economy prompted a slowdown in the pace of Indonesian exports, the prices of Indonesia's leading fall in prices of commodities experienced and the value of Indonesia's exports was significantly corrected (Ahad & Anwer, 2021). At that time, the deficit was recorded at US$ 1.659 million, or a negative movement of 106.37% compared to the previous period. In addition, during this period there was a high import of fuel oil and gas to meet domestic needs accompanied by the weakening of the rupiah exchange rate (Ferdiansyah, Rahmanto, & Slamet, 2021). Indonesia's exports moved negatively at that time, while imports increased by 8.03%. Conditions put greater pressure on Indonesia's trade balance until it finally recorded a deficit

Currently, Indonesia is facing a possible crisis due to the Covid-19 pandemic. Until June 2020, Indonesia's foreign trade position showed a surplus of US$ 19,183 million. This was driven more by the decrease in the value of imports which was bigger than the decrease in the value of exports. Indonesian imports are dominated by raw goods which are then processed into various commodities which are distributed to the public. During the Covid-19 pandemic, Large-Scale Social Restrictions were imposed, this significantly reduced people's mobility and hit the business sector. With this condition, people's purchasing power is reduced, or some others prefer to delay purchases by placing more importance on saving funds for emergency conditions. This has resulted in reduced public demand for many commodities, particularly secondary and tertiary goods.

The Covid-19 pandemic has driven the weakening of the world economy and resulted in a decline in market demand. Some countries have even entered the brink of recession. This condition will put pressure on Indonesia's export performance. This is because the domestic income of Indonesia's trading partners has a positive influence on Indonesia's export performance (Wirjatmadi & Suryadinata, 2020). This means that when there is pressure on the domestic economy of Indonesia's trading partners, the demand for Indonesian commodities will decline so that Indonesia's export performance will weaken. This is reflected in the value of Indonesia's exports during the pandemic, which tends to decline. On the other hand, the government provides several stimuli to encourage the industrial sector and export-import activities through several fiscal and non-fiscal policies.

Literature Review

The exchange rate system is the system used to determine the price of the rupiah against foreign currencies. There are three exchange rate systems that can be considered by the government to be determined as the prevailing exchange rate system, namely: 1. Fixed Exchange Rate System; 2. Floating/free Exchanged Rate System; 3. Controlled/Managed Floating Exchanged Rate System. Fixed exchange rate system, a system in which the domestic currency exchange rate is set at a certain level against the foreign currency value; a controlled floating exchange rate system is an exchange rate system where the currency value will be submitted to the market depending on the demand and supply of currency but there is supervision from the Central Bank and the Central Bank will intervene in the market if it is deemed that the exchange rate is not within the limits set by the central bank ; A Floating/free exchanged rate system, a system in which the domestic currency exchange rate is floated against the foreign currency value, or in accordance with market movements where the currency exchange rate occurs based on the demand and supply of foreign currency (Smith, Walter, & DeLong, 2011).

The first exchange rate system implemented in Indonesia was a fixed exchange rate from 1970 to

November 1978. The second, changed to a controlled exchange rate until mid-1997, The adoption of a controlled exchange rate policy in November 1978 was expected to achieve a realistic rupiah exchange rate. With a floating nature, a fair value can be achieved based on supply and demand in the exchange market, and with a "controlled" nature, it is hoped that fluctuations can be regulated (orderly manner) so that the element of speculation that can hamper exports and monetary stability and stimulate excessive imports can be avoided. In a controlled floating exchange rate system, the exchange rate may fluctuate within the corridors or limits set by the Monetary Authority. If there is a change in the exchange rate of a currency that touches the specified limit (intervention band), then the Monetary Authority will intervene (Hallward-Driemeier, Kochanova, & Rijkers, 2021).

The purpose of this control or intervention is so that the rupiah is not too volatile and remains reasonable. An exchange rate that is too volatile will have a negative impact on the flow of goods, services and capital, which in turn will affect the national economy. In addition, too volatile exchange rates will encourage counter-productive actions (speculators), which clearly have a negative impact on the national economy. In this case the balance of payments imbalance is automatically corrected without the need for special government economic policies; 2. A country's foreign currency reserves are relatively intact, in the sense that they are not used to intervene in the foreign currency market for exchange rate stabilization. The national currency rate is automatically adjusted to the exchange rate in the foreign exchange market; 3. Relatively more protective against fluctuations in the world economy. Countries that implement this system will not be directly bound by the possibility of high world inflation fluctuations. It is also a broader safeguard from shocks and fluctuations in the world economy; 4. The government has greater economic freedom in determining economic policies in its country. This means that the government can freely choose whatever level of domestic demand it wants and easily allow exchange rate movements to solve various problems in its balance of payments; 5. Asymmetrical conditions and injustice can be avoided.

The Third, changed to a free exchange rate until now. The free exchange rate system has several drawbacks, namely: a. Decision makers, in this case the central bank and the government, are no longer burdened with worries about reducing foreign exchange reserves to maintain the exchange rate. Thus, it can lead to the implementation of fiscal and monetary policies that are too expansive, which can result in the country's economy entering the inflation trap. In other words, a free-floating exchange rate system can lead to a lack of government discipline in setting its economic policies. b. The emergence of speculation destroys stability and disruption to financial markets. This stability-destroying speculation tends to increase volatility in currency exchange rates in the long run than would otherwise occur as a result of unexpected economic disruptions. This will bring uncertainty to trade and investment, especially in all matters relating to foreign payments. c. The emergence of economic policies that are not well coordinated. Each country will be more likely to implement a unilateral economic policy that benefits itself, regardless of the negative impact of the policy on other countries (Hallward-Driemeier et al., 2021).

The emergence of the illusion of greater autonomy. Economic policy makers cannot ignore the effect of implementing economic policies on foreign exchange rate conditions, and vice versa. A depreciation that increases the price of imported goods will lead to an up in the wage of labor. This will increase the selling price of the commodity, thereby stimulating inflation, which in turn leads to demands for higher wages. therefore, in the end a free-floating exchange rate system can speed up the price reaction to an up in the money supply (this system does not really strengthen control over the real money supply level).

The consequences that arise with the implementation of a free exchange rate system are as follows: a. The government does not need to devalue its currency because it has been submitted to the prevailing market mechanism; b. Foreign exchange reserves need not be large; c. The money supply tends to be easy to control. With the implementation of this latter system, the rupiah currency rate is fully determined by the market so that the prevailing currency rate is truly a reflection of the balance between the forces of supply and demand. (Hallward-Driemeier et al., 2021).

To maintain exchange rate stability, Bank Indonesia from time to time performs sterilization in the foreign currency market, particularly in times of excessive exchange rate fluctuations. Systemically, the Government of Indonesia has implemented both a fixed and a floating exchange rate system and its variants. Which system is more effectively implemented by the Government of Indonesia, of course, depends on several factors, including the level of economic openness of a country, the level of independence in implementing economic policies, and the

economic activities of a country.

With the implementation of the latter system, the rupiah exchange rate is fully determined by the market so that the prevailing currency rate is truly a reflection of the balance between the forces of a demand ndsupply. To maintain exchange rate stability, Bank Indonesia from time to time performs sterilization in the foreign currency market, particularly in times of excessive exchange rate fluctuations. Developments in the global economy have had a significant impact on the Indonesian economy, and in this regard, Bank Indonesia seeks to reduce the impact of the global financial crisis on domestic financial markets. One of the efforts made by Bank Indonesia is to increase the supply of foreign currency in the domestic financial market in order to maintain the stability of the rupiah currency rate. The achievement of sufficient foreign currency liquidity conditions in the domestic financial market will provide a positive impetus to the movement of the rupiah exchange rate (Hallward-Driemeier et al., 2021).

In accordance with the objectives to be achieved by the Central Bank, that the stability of the rupiah value is indicated by the stability of the rupiah value in the country as a measure of the inflation rate, while the stability of the rupiah value in the country is measured by the exchange rate, which is the development of the domestic currency exchange rate against other country's currency. The stability of the exchange rate is very important to encourage economic growth which in turn can increase economic development so as to achieve the welfare of its people. The monetary policy adopted by Bank Indonesia is carried out in a sustainable, consistent and transparent manner so that it can be used as a definite and clear reference for the business world and the wider community. The policies taken by Bank Indonesia first take into account their impact on the national economy as a whole, including the state finance sector and developments in the real sector.

The balance of payments is a record of a country's economic transactions with other countries due to international cooperation in the form of foreign trade, namely the purchase and sale of goods abroad; exports of goods, services and capital. The balance of payments consists of three parts, namely: First, the trade balance is the difference between the export of goods and the import of goods. Second, the current account is the difference between the export of goods and services and the import of goods and services. Third, capital transactions, namely the flow of capital out and capital in

There is an effect of the exchange rate on the trade balance, especially when the exchange rate price is fully submitted to the market (in a floating exchange rate system), where when there is a depreciation in the domestic currency it causes the prices of imported goods to become expensive in the domestic market and this This will cause the demand for imported finished products to decline, while on the other hand, when the domestic currency is depreciated, export products in the international market will become cheap and export demand will increase so that this condition will improve the position of the trade balance.

The opposite condition if there is an appreciation of the domestic currency compared to foreign currencies, the value of exports will decrease and the value of imports will increase so that it will worsen the position of the trade balance

There is a large body of literature on the effect of exchange rates on trade balance. The majority of the evidence in the literature supports the theory that a depreciation in exchange rates increases exports and has a positive impact on trade balance using fixed exchange rate data and Liu et al. (2021) using flexible exchange rate data.

Previous research that analyzed the effect of exchange rate uncertainty on the trade balance using the Marshall-Lerner condition method concluded that there had been an increase in the trade balance in the long term due to the effect of real value depreciation, Vural (2016) focused their research on exchange rate volatility on trade. with the assumption that exchange rate fluctuations are solely driven by shocks from exogenous factors and are not influenced by other variables. This indicates that there has been a strong positive relationship between real exchange rate volatility and international trade

The short-term impact of the effect of the exchange rate on the trade balance is indirect. According to Staiger and Sykes (2010), saying that a country's trade is influenced by a number of factors, including the currency used by domestic producers for their goods, producers will set the price of their goods in the national currency (or if the national wage is fixed), so that an unexpected devaluation will lower the price of domestic goods relative to foreign goods, this will cause that in the short term fluctuations in exchange rates have no direct effect on trade

Several previous studies that analyzed the impact or influence of the exchange rate on the trade balance, among others: Sinamo and Hanggraeni (2021) concluded that a devaluation policy will

result in an increase in the trade balance due to an increase in the value of exports and a decrease in the value of imports, this is stated from his research which examines the impact of exchange rate against the trade balance. Twarowska and Kakol (2014) says that the exchange rate will increase when using a flexible exchange rate and has a unidirectional relationship with the trade balance. A study conducted by Myong Shik Choi (2017) concluded that the increase in the trade balance was due to the depreciation of the real currency and this was investigated in some developed countries. In Morocco, it occurs that exchange rate fluctuations do not have an impact on foreign trade studied by Ho, Nguyen, and To-The (2021), in this case differing opinions with other studies.

In Pantai Gading using a fixed exchange rate system policy, it shows that the effect of the real exchange rate on foreign trade transactions shows a significant positive effect both in the long and short term, this conclusion is based on the results of research conducted by Drama (2010) , where the dependent variable is the foreign trade balance while the independent variables are real exchange rates, interest rates, foreign currencies, and domestic income. His research used a multivariate cointegration test using an error correction model. In Kenya, it shows a unidirectional and significant relationship between the real exchange rate and the foreign trade balance that has been adjusted both in the long and short term, namely the results of research from (Ogutu, 2014), the data used is annual time series data. The results of research by Vural (2016) say that due to fluctuations in exchange rates, both short and long term, it has worsened the position of the foreign trade balance. The deteriorating foreign trade area due to the increasing depreciation of the exchange rate, this is the conclusion of the research results of Keho (2021) besides that it also finds that there is an inelastic relationship between the nominal exchange rate and the foreign trade balance in the long term.

In Pakistan, exchange rate volatility has hampered the value of imports and exports, it is concluded from the results of research by Khan, Azim, and Syed (2014), they examine the impact of domestic and foreign exchange rate volatility on the demand function. export and import trading partners in Pakistan. To distinguish volatility in both the long and short term, the technique used in this research is the least squared dummy variable.Dada et al. (2021) researched in Ghana, concluding that the exchange rate has a negative effect on the foreign trade balance in the long term. There are also other independent variables included in the model, namely the consumer price index and gross domestic product, the results state that gross domestic product and consumer price index have a negative effect on the trade balance.

Bahlo et al. (2009); DENG and ZHU (2010) mengatakan bahwa di Slovakia perkembangan neraca perdagangan luar negeri akibat adanya depresiasi mata uang asing mula-mula membaik tetapi seiring berjalannya waktu menjadi memburuk, dan ternyata dipengaruhi pula oleh struktur neraca perdagangan luar negeri itu sendiri dan istensitas penjualan barang ke luar negeri. Menurut Yerkudov et al. (2021), Di Slovakia tidak terdapat hubungan antara nilai tukar dengan neraca perdagangan luar negeri, hal tersebut diungkapkan dalam penelitiannya. adapun variabel bebas lainnya ang dimasukkan dalam model adalah produk domestik bruto dalam negeri dan produk domestik bruto dunia. Sementara itu neraca perdagangan antara Turki dan mitra dagang Jerman menyimpulkan bahwa dimungkinkan adanya dampak perubahan nilai tukar riil pada neraca perdagangan masing-masing industri akibat disagregasi tingkat komoditas. Hal tersebut merupakan hasil kesimpulan dari penelitian dampak nilai rukar riil terhadap neraca perdagangan luar negeri yang dilakukan oleh Vural (2016) dengan menggunakan teknik kointegrasi dan model koreksi kesalahan.

Choi (2017) investigated the factors that influence exchange rate fluctuations in Pakistan's trade balance, other independent variables included in the study were interest rates, inflation, growth, exports, imports, and oil prices, and concluded that exchange rate volatility negative impact on the economy. The results of research conducted by Abbas Ali, Johari, and Haji Alias on the movement of the exchange rate on the foreign trade balance using a dynamic model show that the exchange rate has a major impact on the foreign trade balance.

Data Analysis Technique

In this study, the foreign trade balance is the dependent variable, while the exchange rate, inflation rate, interest rate, economic growth, export price index and import price index are independent variables.

Time series data for the period 1980 to 2020 used in the study with a period of a controlled floating exchange rate system from 1980 to 1997 and from 1998 to 2020 is a period of a flexible exchange

rate system.
To analyze the difference in the average of the balance of trade variables and the difference in the impact of the exchange rate during a managed floating system with a flexible system period, the model used is a dummy variable model with the following criteria:

D = 1 for the period of the flexible exchange rate system
D = 0 for the period of a managed/controlled floating exchange rate system

The models used are:

$$TB = a_1 + a_2Dt + \beta_1ER + \beta_2ER*Dt + \beta_3INF + \beta_4INF*Dt + \beta_5EPI + \beta_6EPI*Dt + \beta_7IPI + \beta_8IPI*Dt + \beta_9Gt + \beta_{10}Gt*Dt + \mu t$$

TB = Trade Balance
ER = Exchange Rate
INF = Inflation
EPI = Export Price Index
IPI = Import Price Index
Gt = Growth

The data used is times series data and usually times series data stores many problems including autocorrelation, autocorrelation causes the data to be non-stationary which indicates that the average value and variance of the times series data changes systematically over time or the average value and the variance is not constant, this will result in a less good model to be estimated so that the results given can be spurious (Doshi & Vanjara, 2022). Therefore, before conducting further analysis, the characteristics of the data will be tested using the unit root test.
Unit root test akan digunakan untuk mengevaluasi karakteristik data. Uji unit root khususnya uji Augmented Dickey Fuller (ADF) diperlukan untuk mengetahui apakah data tersebut stasioner atau tidak. Hasil uji akar unit akan menunjukkan bahwa data stasioner pada level dan stasioner pada perbedaan pertama, atau stasioner pada perbedaan kedua. jika data stasioner pada level tersebut, maka model tersebut stasioner dan dapat dilanjutkan dengan melakukan regresi model melalui model Ordinary Least Square.
To find out the characteristics of a data whether the data is stationary or not, a unit root test is needed through the Augmented Dickey Fuller (ADF) test, the result is stationary or not, it can be seen whether it is stationary at the level level, the first difference level, or the second difference level. If the test results are stationary data at the level level, then the regression coefficient estimation model can directly use the Ordinary Least Square model.
Furthermore, it must be seen whether the data is stationary in the first difference or the second difference, this is intended to determine whether the data has a relationship between variables or not, namely by using the cointegration test.the method that can be used to perform the cointegration test is the Johansen test. After getting the results from the cointegration test, the model used is the Error Correction Model (ECM).), a cointegration relationship can be seen as a long-term relationship (equilibrium), but it is suspected that there is an imbalance in the short term (Doshi & Vanjara, 2022).
ECM (Error Correction model) is a model used for short-term relationship analysis and it is assumed that the variables do not have an equilibrium relationship, so that in the short term it is necessary to correct the model by using the residuals obtained from the previous stage so that the variables can return to the process towards long-term equilibrium. long. The ECM model uses the two steps model from Engle-Grager, the ECM model can be written with the following equation:

$$\Delta TB_{it} = a_1Dt + a_2\Delta Dt + \beta_1\Delta ER_t + \beta_2\Delta(ER_t*Dt) + \beta_3\Delta INF_t + \beta_4\Delta(INF_t*Dt) + \beta_5\Delta EPI_t + \beta_6\Delta(EPI_t*Dt) + \beta_7\Delta IPI_t + \beta_8\Delta(IPI_t*Dt) + \beta_9\Delta Gt_t + \beta_{10}\Delta(Gt_t*Dt) + \beta_{11}EC_{t-1}$$

Where Δ is the difference; a is intercept; β is the slope of the independent variable, ECt is the error correction. If the EC imbalance error coefficient is statistically significant, it means that the ECM specification model used in the study is valid.
Research hypothesis:

1. In the short term, the exchange rate affects the trade balance in Indonesia in both a flexible exchange rate system and a managed floating system.m
2. The long run, the exchange rate affects the trade balance in Indonesia in both a flexible exchange rate system and a managed floating system.
3. There is an average difference in the trade balance during the flexible exchange rate system with the managed floating system

Result

The test begins with a data stationarity test, which is to see whether the data is stationary or not. The stationarity test of the data used the unit root test using the ADF test, with the following results:

Table 1. ADF test

Variable	Probability	
	At Level	First Difference
TB	0,3761	0,0000
ER	0,0004	0,0000
INF	0,0000	0,0000
EPI	0,9282	0,0000
IPI	0,9127	0,0000
Gt	0,0004	0,0000
Dt	0,7030	0,0000

Sources : result of data processing

Based on the unit root test with ADF in table 1, it can be seen that the variables ER, INF, and Gt are significant at the at level, meaning that the data is stationary at the at level but other variables, namely TB, EPI, IPI, Dt are stationary at the first difference. The existence of variable data that is not stationary at the at level, then it is necessary to perform a cointegration test to see whether or not there is a long-term relationship between variables. Cointegration test results are as follows:

Table 2. Cointegration test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.851269	217.9141	159.5297	0.0000
At most 1 *	0.743510	143.5951	125.6154	0.0025
At most 2	0.570098	90.52910	95.75366	0.1084
At most 3	0.470224	57.60540	69.81889	0.3162
At most 4	0.397481	32.82867	47.85613	0.5663
At most 5	0.165934	13.06989	29.79707	0.8884
At most 6	0.133786	5.993644	15.49471	0.6963
At most 7	0.010009	0.392337	3.841466	0.5311

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level

Sources : result of data processing

Table 2 results show that there is cointegration between variables at the 95 percent confidence

level, which rejects the null hypothesis that there is no cointegration. Accepting Ha, which states that there is cointegration between variables, means that there is a long-term balance but a short-term imbalance is suspected.
Cointegration that occurs between variables requires error correction to the model in order to eliminate imbalances that occur in the short term, the results of the error correction model (ECM) using Engle-Granger are as follows:

Tabel 3. Error Correction Model (ECM)

Dependent Variable: D(TB)
Method: Least Squares
Sample (adjusted): 1981 2020
Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.092347	0.348218	-0.265197	0.7930
D(D01)	1.224911	44.62159	0.027451	0.9783
D(ER)	0.704455	1.036478	3.114984	0.0354
D(ER*D01)	-0.509775	4.732388	-0.107720	0.9151
D(INF)	-0.017125	0.048109	-0.355960	0.7249
D(INF*D01)	0.033892	0.078386	0.432372	0.6692
D(EPI)	-0.077091	0.028299	2.724145	0.0105
D(EPI*D01)	-0.086112	0.035634	2.648210	0.0412
D(IPI)	-0.044939	0.016688	-2.692901	0.0113
D(IPI*D01)	0.056759	0.019234	2,762302	0.0282
D(GT)	0.190466	0.170508	1.117051	0.2746
D(GT*D01)	0.019390	0.360385	0.053804	0.9575
EC(-1)	-1.255996	0.201337	-6.238268	0.0000

Sources : result of data processing

Based on table 3. The probability for EC (-1) shows that it is smaller than 5% which means it is statistically significant that the error correction model (ECM) used in this study is valid and furthermore it is feasible to be analyzed.
The value of the EC coefficient = -1.255996 means that the difference between the actual value of the trade balance and the balance value of -1.255996 will be adjusted within one year, thus the following equation can be made:

The short-term equation for the trade balance during the flexible exchange rate system is as follows:

TB = -0.946054 + 0.704455ER - 0.017125INF - 0.077091EPI - 0.044939IPI + 0.190466Gt

The independent variables that are statistically significant to the trade balance in the short term during the flexible exchange rate system are the exchange rate (ER), import price index (IPI), export price index (EPI), while inflation (INF) and production growth (IP) no effect.
The short-term equation for the trade balance during a managed floating exchange rate system is as follows:

TB = (-0.946054 + 1.224911) + (0.704455 - 0. 509775)ER + (- 0.017125 + 0.033892) INF + (-0.077091 - 0.086112)EPI + (-0.044939 + 0.056759)IPI + (0.190466 + 0.019390)Gt
TB = 0,278857 + 1,21423ER + 0,016767INF - 0,163202EPI + 0,01182IPI + 0,209859Gt

The independent variables that have a statistically significant effect on the trade balance in the short term during a managed floating exchange rate system are the export price index (EPI), the import price index (IPI), while the exchange rate (ER), inflation (INF) and economic growth (Gt) no effect.

The long-term trade balance regression equation model that has passed the multicollinear, heteroscedastic, and autocorrelation tests is as follows:

Table 4. Long Run Balance of Trade Model

Dependent Variable: D(TB)

Sample (adjusted): 1980 2019

Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.864924	6.714598	0.575600	0.5698
D01	0.452987	2.164381	0.209291	0.8359
ER	-0.157153	0.074842	-0.482764	0.0454
ER*D01	3.966090	4.837137	0.819925	0.4197
INF	-0.133810	0.072066	-1.856756	0.0747
INF*D01	0.061405	0.084026	0.730778	0.4714
EPI	-0.080818	0.038464	2.101121	0.0455
EPI*D01	-0.098018	0.035542	2.205591	0.0433
IPI	-0.036211	0.019112	-1.894648	0.0693
IPI*D01	-0.021557	0.023705	-0.909404	0.3715
GT	-0.733689	0.339530	-2.160898	0.0401
GT*D01	1.032056	0.365627	2.822706	0.0090

Sources : result of data processing

The long-run equation for the trade balance during a flexible exchange rate system is as follows:

TB = 3.864924 - 0.157153ER -0.133810INF - 0.080818EPI - 0.036211IPI -0.733689Gt

The independent variables that are statistically significant (a = 5%) on the trade balance in the long term period of the flexible exchange rate system are changes in exchange rates (ER), export price index (EPI) and economic growth (Gt) while inflation (INF) and index import prices (IPI) only affect the 90% confidence level (a = 10%)

The long-term equation for the trade balance during a managed floating exchange rate system is as follows:

TB = (3.864924 + 0.452987) + (- 0.157153 + 3.966090) ER + (-0.133810 + 0.061405) INF + (0.080818 + 0.098018) EPI + (- 0.036211 -0.021557) IPI + (-0.733689 + 1.032056Gt

CI = 4,317911 + 3,808937ER – 0,072405INF - 0,178836EPI – 0,021557IPI + 0,298361Gt

The independent variables that have a statistically significant effect (a = 5%) on the trade balance (TB) during a controlled floating exchange rate system are: Export price index (EPI), economic growth (Gt), while the exchange rate (ER), inflation (INF)), the import price index (IPI) has no effect on the trade balance (TB).

Based on the equation of the dummy model, it can be stated that there are differences in the results of the trade balance during a managed floating exchange rate system with a flexible exchange rate system for the export price index (EPI) and economic growth (Gt) variables.

Discussion

The results of data analysis show that the long-term exchange rate (ER) during the controlled floating exchange rate system and the flexible exchange rate system has an effect on the foreign trade balance (TB) in line with the study results: Albrecht et al. (2014); Drama (2010); Khan et al. (2014); Sadok (2021); Sinamo and Hanggraeni (2021); Twarowska and Kakol (2014); Vural (2016), Meanwhile for the short term exchange rates has no effect on the trade balance both during flexible exchange rate system and controlled floating system Bahlo et al. (2009); (Staiger & Sykes, 2010) and Xiaohong and Pengjiao (2010).

The relationship between the exchange rate and the foreign trade balance in the long term during the controlled floating exchange rate system shows a positive value, meaning that when the rupiah exchange rate decreases, which means that there is a depreciation of the rupiah, the trade balance will decrease, this is because when the rupiah depreciates the price of imported goods becomes expensive. so that the demand for foreign goods decreases and the value of purchasing goods from abroad decreases. On the other hand, many imported inputs are used to produce products both for domestic consumption and for export goods which causes the cost of production of goods to rise so that the price of export goods increases which results in a decrease in export demand, the value of exports decreases. on the trade balance

The direction of the influence of the exchange rate on the foreign trade balance in the long term during the flexible exchange rate system shows a negative value, indicating that when the rupiah exchange rate decreases, indicating rupiah depreciation, the trade balance increases. imported products meanwhile the outsiders have realized that the price of our export goods has become cheap so that the demand for exports has increased, this has caused the value of the trade balance to rise.

The export price index, both during the managed floating exchange rate system and flexible exchange rate system for the long and short term, affects the trade balance and has a negative direction which means that when the price of export goods rises, the trade balance falls, this happens because export demand falls. and the value of exports will fall

Economic growth also affects the foreign trade balance during the flexible exchange rate system and the floating system is managed for both the long and short term, but during the flexible exchange rate system it has a negative direction which means that if economic growth increases, the trade balance will decrease which means that when there is an increase in national income, the value of imports increases, causing the foreign trade balance to fall. Meanwhile, under the manage of the floating exchange rate system, when economic growth occurs, imports do not tend to increase.

Conclusion

1. In a flexible system, the exchange rate affects the trade balance in Indonesia, whereas in a managed floating system, it has no effect in the short term.
2. In a flexible system, the exchange rate affects the trade balance in Indonesia, whereas in a managed floating system, it has no long-term effect.
3. The average difference in trade balance during the managed floating period of the flexible exchange rate system is only for the export price index and economic growth.

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