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## Exchange Rate, Monetary Policy and Balance of Trade: An Empirical Investigation of Pakistan

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### Contents:

- [Introduction](#)
- [Research Questions](#)
- [Literature View](#)
- [Data and Methodology](#)
- [Data and Sources](#)
- [Model Specification](#)
- [Results](#)
- [Finding & Discussion](#)
- [References](#)

**Abstract:** *The current study investigates the real influence of the rate of exchange in real terms, GDP in real terms, money supply and infrastructure on the balance of trade in Pakistan by employing Johnson co-integration and ECM. The real GDP and infrastructure positively affected minimising the gap of trade deficit to improve the trade performance of the economy of Pakistan. In contrast, the factor of effective exchange rate and money supply negatively affected on trade deficit of the country. The rate of R-Square is 0.85; it tells that 85% variation in the balance of trade is captured by independent variables. The important recommendation of this research is that the exchange rate should be stable and consistent with the equilibrium path. The negative ECM value of -40 obviously pointed out that there is a 40% convergence of the total said parameters in minimising the gap of trade deficit for the economy of Pakistan.*

**Key Words:** Trade Balance, Exchange Rate, Annual Data

### Introduction

International exchange is the base of development for any country in the world. The trade of any country includes the transfer of goods and services for the sake of monetary benefits. At the same time, the trade deficit is the difference between imports and exports from any nation to another nation. When the income gotten from exports is less than the imports value, that nation is counted in the condition of deficit of trade. The researchers have

kept the difference between the trade deficit and economic growth value as a very important debate of the new era. One should not deny the crucial need for trade development for the sake of globalisation. The mobility of goods, services and capital is become possible only because of the existence of trade activities. Every country that wants to stand at the best stage on the ground of international competitiveness is going to fight for the quality of goods and services for the sake of monetary benefits and globalisation. The stable

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trade policies for any country are as important as some other basic determinants of trade development. The market size of any country also determines the trade deficit and trade surplus. As the GDP or market size of any country increases, it contributes positively to the development of trade. Unfortunately, Pakistan has remained in the problem of trade deficit over the years. The deficit of trade has very many adverse impacts on the economy of the country. The Central Bank (State Bank) is key responsible for controlling imports of the country, which is badly failed. The foreign reserve ratio of the country is declining very fast. Government is in a tough situation to pay the bills of imports, and as a result of that, foreign currency is becoming strong as compared to domestic currency (as US dollar to a rupee). The economy of Pakistan always remains in a crisis of trade deficit as imports are increasing more than exports. The demand is more than the supply, which requires more ratios of imports than exports. The demand for capital goods, industrial goods and consumer goods is more much a structural problem for the country due to the problem of the financial system. The efficiency of the economy also depends upon the income and price elasticity of goods and services of any country. The countries also require liberal trade policies, trade restrictions and rational behaviour.

If we consider the monetary policy of any country, it plays a very supportive and important role in the enhancement of Pakistan's trade balance. By lowering the interest rate, investment opportunities will be increased. As a result, there will be more production of goods. With the production of goods, the exports of the country will be increased to help minimise the gap between exports and imports to decrease the trade deficit problem. On the other hand, the money supply, if controlled, it will cause to decrease in the problem of inflation, and the cost of production will be decreased, which will also help to establish a strong industrial sector for the improvement of exports for the betterment of trade structure of Pakistan. On the same line, if the money supply is uncontrolled, then it will increase the inflation problem that can create the problem of trade deficit by increasing the cost

of production. If the cost of production increases, it will decrease the exports, which will create more burdens on the imports also. The Gross National Product (GNP) is also changed by money supply and expenditures done by the government, and this was validated when the analysis was done under the shadow of different developing countries such as India, Pakistan and Bangladesh ([Upadhyaya, 1991](#)).

The infrastructure is also the base of development for the different countries of the world. The agricultural, industrial and services sectors become competitive only with infrastructure. When there is the opportunity for infrastructure means, the roads and communication become easy for raw materials and supply of goods and services easy access. Then it will impact positively on the balance of trade of any country in the world. The key indicators of development as infrastructure (hard and soft), natural resources, the system of finance, the openness of any economy, access to science and technology, the development of human resources, the institutions of the country, the government and governance policies of any system. The production capacity of any country determines the value and standard of that country. The capital accumulation of a country is favourable for the competitive market of that economy.

The mismanagement of the exchange rate has created more instability in the pattern of trade deficit. The researchers have found a strong influence of the exchange rate on the trade deficit. The real effective exchange rate and the trade deficit have become very debated by social scientists. Some models of exchange rate showed that unpredictable behaviour creates a vulnerable situation, an invalid chance which resultantly creates exchange rate issues, and some other examinations showed something different ([Khan etc. al. 2014](#)). [Parveen et al. \(2012\)](#) bifurcated different elements for the economy of Pakistan. The trade impacted by the euro and Mexico is unpredictable and unstable [Vergil \(2009\)](#). The micro structuring approach was used for the analysis of uncertainty in exchange rate [Friedman \(2010\)](#).

It is very important here to note that several studies of the world are under debate whether a real effective exchange rate is either favourable for trade

or not. The exchange rate is used as a base for regulation of flows in the context of trade and capital for free or restricted movements by developing economies of the world, which are under the trap of trade deficit continuously for exchange problems due to operational gaps and volume of imports and exports (Bhattarai and Armah, 2005). The developing countries of the world are in inelastic demand whereas the intensity of imports is higher than that of exports. As a result of this higher import growth, trade imbalances are created. The tool of a real effective exchange rate helps us to reduce this gap. In global rebalancing, the trade balance to the real effective exchange rate is a basic determinant which may impact significantly and effectively (Kharroubi, 2011).

The trade deficit is a very basic macroeconomic indicator on the basis of the overall performance of the economy is judged. Poor economic condition is the result of serious trade deficit problems. The misappropriation of policy making is also leading to higher trade deficits.

### Research Questions

1. What is the role of monetary policy on the deficit of trade?
2. What is the linkage between the supply of money and the trade deficit?

### Literature View

Tarawalie and Kapana (2022) analysed the effect of monetary policy and exchange rate on the balance of trade. They used the ARDL model for annual time series data from 1980 to 2020. The outcome of this area suggested that money supply and exchange rate have an adverse effect on the balance of trade, and GDP have a positive impact on the balance of trade in Pakistan. Real GDP, FDI and government expenditures are the main factors of the balance of trade in Pakistan.

[Keho \(2021\)](#) worked on the basic parameters of trade deficit for the West African Economic and Monetary Union (WAEMU) for the time frame of 1975 - 2017. For the J curve analysis, there was no valid evidence. The conclusion made by this study was that foreign and domestic and foreign income

is negatively related to the balance of trade while trade balance is clearly related to exchange rate as the main reason for depreciation.

[Rehman et al. \(2020\)](#) investigated the long-term and short-term impact of hard and soft infrastructure on exports and trade balance of different South Asian countries by covering the data from 1990 to 2017. Here, the co-integration technique used, which was developed by Campi and Duenas (2019) analysed the different discussions and debates for international competitiveness and resulted that the export environment should be favourable to minimise trade deficit for Pakistan. This research work is a clear direction for proper policy making for international trade.

[Rahmon and Adefunke \(2019\)](#) worked on the monetary and fiscal policy of Nigeria. They took the important variables of their research as; money supply, exchange rate, the rate of inflation, domestic and external debt, the expenditures of government and the balance of trade. They considered the data sample of time series by covering the period 1981 to 2017, and the technique applied in this research work is the methodology given by Johansen. The important analysis of this study remained that the revenue of the government, the expenditure of the government, the inflation rate and the exchange rate are clearly linked to the trade deficit. On the other hand, the money supply, the domestic debt and the debt taken externally have negatively impacted the trade balance of the country of Nigeria.

[Adhikari \(2016\)](#) studied the basic core variables which impacted highly the trade balance between the US and countries of BRICS. The panel data covering the time period 1995 to 2014 was used in the analysis. The determinants which were used included national income, external real GDPs, exchange rate and monetary policy. The conclusion of this revision suggested the findings that the US central bank easing quantitatively has no outcome on the trade deficit of the economy of the US.

Balavac and Pugh (2016) traced the development of various parts of the country by focusing on external factors specifically. Here the sample is applied for the period 1996 to 2020. The

revision suggested that if we improve the agriculture, industrial, and service sector, then the exports of the country will be increased and imports will be decreased.

Awan (2015) worked on the work of financial development of deficit of trade. The variables which were used in this analysis are inflation, trade balance, exchange rate and financial development. The numeric is utilised covering the period 1972 to 2014. ARDL approach was used for co-integration. He concluded that inflation and financial development are direct and significant to trade balance, whereas the exchange rate compressed negatively on the balance of trade.

Ahmed et al. (2014) studied the direct and indirect impression of the real exchange rate on the deficit of trade in Pakistan; specifically, they revealed the dependence factor of convertibility has a positive for the balance of trade. All the results clearly suggested a major positive relationship among each other.

Aslam and Awan (2013) worked on the exchange rate have to impact on the overall growth of Pakistan. The effect of different factors was analysed on the economy of Pakistan. Secondary data was utilised for the period of 24 years, covering the period 1988 to 2011. The results are estimated in this study on the basis of ordinary least squares (OLS). The results concluded that the exports of Pakistan consist of cotton, leather, gemstone etc. It was suggested that we should invest in the industrial sector and export goods after value addition.

Jayachandran (2013) analysed the trade, GDP and Exchange rate, where the exchange rate is explained variable while trade and GDP are the explanatory variables. The main target of this reading was the impact of some important variables on the Indian economy. He used a time series dating from 1970 to 2011. In this research, the data of imports, exports and exchange rate and foreign direct investment are used. All the values are co-integrated and significant. The tendency of the exchange rate was also measured. He recommended that as the exchange rate becomes stable, it will impact upon growth rate positively. The goods and services should be produced in a domestic country

rather than importing them.

Ray (2012) determined the long-term and short-term effects on the balance of trade through different variables by employing the size of the sample by studying the period 1972 to 2011 on the basis of VECM. The exchange rate and feeding patterns are affected negatively by the Indian economy.

Jalil and Feridun (2010) expressed the uncertainty for the rate of exchange of the economy of Pakistan on the basis microstructure approach. They also suggested that the uncertainty for analysis of exchange impacts highly on the balance of trade, which they calculated on microeconomic indicators.

Mohammad (2010) analysed the different factors of the trade deficit of the country by using the ECM approach. The results of this analysis suggested that foreign direct investment (FDI), the income received from remittances, overall domestic consumption by households, and the rate of exchange influenced the trade deficit directly or indirectly. Out of these variables, foreign direct investment and foreign income affected positively minimising the balance of trade in Pakistan, while national household consumption and rate of exchange affected adversely on the deficit of trade in Pakistan.

Zweig et al. (2008) worked on the upshot of the rate of exchange and unpredictability in the fact that appreciation and depreciation impacted highly on trade on small or large scale levels.

## **Data and Methodology**

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Under this analysis, the data is utilised in secondary form for the time period 1980 to 2021. The listed indicators are converted into a natural log form. Johnson's co-integration method is applied to check coherence among the variable, whereas short-run analysis is checked through Vector Error Correction Model (VECM).

## **Data and Sources**

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- Deficit of Trade: Economic Survey of Pakistan.
- REER: (IFS-IMF) various issues

- MS: State Bank of Pakistan
- RGDP: Economic Survey of Pakistan.
- INFRA: ( Method of Principal Component by Researcher)

RGDP= Real Gross Domestic Product  
 INFRA= Infrastructure  
 MS= Money Supply

### Model Specification

$$BOT = \alpha_1 + \beta_1 REER + \beta_2 INFRA + \beta_3 RGDP +$$

$$\beta_4 MS + \sum t$$

BOT= Balance of Trade

REER= Real Effective Exchange Rate

### Results

By checking through the Augmented Dicky Fuller Unit Root test, all the variables are found non-stationary because we cannot go through estimation on non-stationary data, which will mislead us over the estimated results.

**Table 1.** The Results of ADF

Variables	Level (with intercepts &Trend)	First Difference (with intercepts &Trend)
REER	-4.156 (0)	-5.613* (2)
RGDP	-2.516 (1)	-4.2751*(1)
INFRA	-8.458 (0)	-5.361* (4)
MS	-5.345 (2)	-4.244* (1)

\*Significance at 5% level.

In the above table, all the results calculated through the Augmented Dicky Fuller Unit Root test are

found to be non-stationary at a level when the first difference is applied then values became stationary.

**Table 2.** Johnson Co-integration Test (Maximum trace Value)

Null Hypothesis	Alternative Hypothesis	Maximum Trace Statistics	Critical value at 5%
r=0	r=1	81.156	53.212
r=1	r=2	62.26	50.151
r=2	r=3	36.031	34.17
r=3	r=4	27.030	25.12
r=4	r=5	18.91	15.12

\*Significance at 5% level.

In the above analysis, we have analysed Johnson's co-integration by employing the five Vectors model on the basis of maximum trace values. The

short listing approach is used which guides us that there is strong connection amongst the variables.

**Table 3.** The Results of Normalized Equation on Vector (1\*)

Variables	REER	RGDP	INFRA	MS
Coefficient	-4.615*	12.553*	10.123*	-4.16*
t-value	2.50	9.13	10.165	4.45

\*Significance at 5% level.

The coefficient of variables visibly shows that there is a productive impact of RGDP and INFRA on the

balance of trade of Pakistan, while REER and MS have a negative impact on it.

**Table 4.** The Results of ECM

Variables	REER	RGDP	INFRA	MS	C	ECM
Coefficient	-3.322	1.406	2.234	0.852	-46.61	-0.431
SE	1.44	0.712	1.234	0.869	0.17	-0.086

Variables	REER	RGDP	INFRA	MS	C	ECM
t-statistics	1.85	2.12	3.12	1.61	0.33	-5.33
Probab	0.0412	0.0213	0.0018	0.051	0.92	0.0004

\*Significance at 5% level.

The ECM outcomes showed the analysis done in this research is desirable as recommended by the coefficients of error correction model.

### Finding & Discussion

Here we have concluded that the effect of the rate of exchange in real terms is negative on the trade deficit, which is the dependent variable in the short run and long term. The outcome of real GDP is positive for the Pakistani economy, which helps us to reduce the trade deficit problem. The effect of infrastructure is also positive, which will improve the production capacity of Pakistan, and consequently, the exports will be increased, which will minimise the trade deficit of the economy. The supply of money has negatively affected on trade deficit due to the problem of inflation. The rate of R-Square is 0.85, which shows that the model is fit because independent variables will capture 85% of variations. Durbin Watson's score of 2 indicates that there is no problem with autocorrelation between the different parameters used by the study.

### Conclusion and Policy Recommendation

The core indication of this phenomenon is to estimate the weight of monetary policy, rate of exchange, market share (production) and infrastructure trade deficit in Pakistan. The study employed the Johnson Co-integration and error correction mechanism for the size of the sample from 1980 to 2021. The analysis also used the Beta coefficients for comparison of the strength of independent variables on the balance of trade. The Augmented Dicky Fuller test results validated the condition of stationary data. The results also

confirmed the co-integration by explaining the long-run relationship. The results concluded that the supply of money, the exchange rate in real terms, infrastructure and real GDP are the main determinants of the trade deficit of Pakistan. The results found that real effective exchange rate and money supply had an adverse impact on the balance of trade; however, a positive relationship was established between real GDP and infrastructure on the balance of trade. The R square showed that 85% of the variation in the balance of trade is captured by the explanatory variable. The important policy recommendation of this research is that monetary policy authorities should work for continuous, consistent and domestic absorptive monetary policy. Money supply growth should be rational for domestic demand in the context of untraded goods and services. The competitive rate of exchange is the need of the hour for controlling the balance of trade problem. The country should focus on the production of quality goods and services in line with real GDP. The infrastructure should be promoted to enhance the development of the industrial sector as well as the agriculture of Pakistan to tackle the trade deficit problem. The hard and soft infrastructure is only one of the proper bases which recommend proper development by minimising the problem of trade. On the assessment of cost-benefit analysis, it is concluded that globalisation requires proper policy-making for the betterment of countries, regions and the overall globe.

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