

Impact of Monetary Policy Shocks and Exchange Rate on Trade Balance in Pakistan: A Vector Autoregressive Model Approach

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Abstract

This study examines the effect of fluctuations in exchange rates and shocks to monetary policy on Pakistan's trade balance. The monthly time series data from January 2005 to December 2021 will be utilized for this study. Zivot Andrew structural unit root test has been used to assess the stationarity and structural breaks in the data series. The ARDL VEC model has been used to identify the long-run relationship due to different orders of integration among the series. In particular, the response of the trade balance towards shocks, exchange rate fluctuation and monetary policy shocks has been examined using the Vector Autoregressive model. It has been observed that the contractionary monetary policy has positively affected the balance of trade in the country, while the exchange rate shock at first showed a beneficial effect on the balance of trade in the country. Still, later on, that influence was neutralized, which means a policy of depreciating the currency to boost trade may give little results.

Keywords: Zivot Andrew Unit Root Test, Vector Autoregressive model, Vector error correction model, monetary policy shock, exchange rate shock.

1 Introduction

Balance of Trade is an integral part of the balance of payment and is widely considered a major indicator of a country's external competitiveness. In a particular period, the trade balance is calculated as the ratio of exports to imports, which can be interpreted as nominal and real (Bahmani, 1991; Hsing, 2005). If the volume of exports in a country is higher than the volume, the country has a trade surplus. If the export volume is less than the import volume, the country has a trade deficit, and efforts are needed to boost the exports to avoid economic imbalance. International trade is a key component to stimulating economic growth and a major source of foreign exchange reserves. Export-based international trade is crucial for developing economies

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due to their reliance on foreign exchange reserves linked to inflation (Ahmad et al., [2022](#)).

The monetary policy shocks and their effects have remained a matter of discussion between economists for a long time, but empirical studies have come up with contradictory results. Mundell ([1963](#)), Flemming's ([1962](#)), and Dounbush's ([1976](#)) models suggested that the expansionary monetary policy depreciates the foreign exchange rate, which became the reason for the decline in the balance of trade; this is also known as a spending-switching effect. The model by Meade (1951) and Alexander (1952) suggested that the expansionary monetary policy stimulates domestic demand, which then puts its weight on the import side, leading to a decline in the balance of trade in the nation.

Fluctuations in the foreign exchange rate help the concerned authorities manoeuvre the external balance to a certain acceptable level. When a country faces persistent trade deficits, currency devaluation is used to attract international buyers to alleviate the deficit or at least to contract it (Tarawalie & Kpana, [2022b](#)). The Marshal Lerner theoretical model suggests that for developing countries, it is fruitful to devalue their currency if they intend to get the maximum gains from international trade (Shahzad et al., [2023](#)). It is also said that improving the trade balance is a slow and steady process that requires time. First, it adjusts and then improves. The adjustments were initiated right after the trade balance worsened, parallel to the devaluation of the currency. This happened due to initial trade contracts done at earlier rates, which show slow and steady accordance of the trade balance towards the improvement, which correlates with the explanation provided by the J curve (Hakimzai, [2023](#)). Pakistan faced almost a 28-billion-dollar trade deficit in 2022-2023; from 2005 to the date, the Pakistani rupee has depreciated by 440%. Surprisingly, during most of the mentioned period, Pakistan had a contractionary monetary policy, and it has been too long since the policy rate in Pakistan remained in double digits (Khan et al., [2023](#)).

The study aims to empirically evaluate the impacts of shocks of monetary policies and fluctuations of rate in the foreign exchange rate on Pakistan's balance of trade (Asadullah & Tabash, [2023](#)). Time series data from January 2005 to December 2021 will be analysed every month. The significance of our study is based on the incorporation of time series monthly data from the past 17 years, which allows for an empirical analysis of the impact of monetary policies and foreign exchange rate shocks on the trade balance (Ali et al., [2023](#)).

The study has investigated the impacts of monetary policy shocks without fragmenting between contractionary and expansionary monetary policy. Another study can be conducted with the same objective for both eras, when Pakistan had adopted an expansionary monetary policy and when Pakistan adopted a contractionary monetary policy (Zahra et al., [2023](#)).

2 Literature Review

Tarawalie and Kpana ([2022](#)) examined the impact of monetary policy and exchange rate fluctuations on Sierra Leone's trade balance using yearly time series data from 1980 to 2020. The autoregressive distributed lag (ARDL) bound testing approach was employed for this analysis. The long-term results of real GDP, effective exchange rate, and money supply mainly influenced Sierra Leone's trade balance. It was found that there was a positive correlation between real GDP and trade balance, while the trade balance was negatively affected by the real effective exchange rate and money supply (Mirza et al., [2023](#)).

In Udejaja et al. ([2020](#)) analysis, the paths through which monetary policy shocks were transferred to the current account balance in Nigeria were explored. The research used quarterly time series data spanning from 1986 to 2020. The structural VAR approach assessed the response of each endogenous shock to shocks in other variables. Moreover, it was found that exchange rate shocks significantly impacted the trade balance component, while natural interest rate shocks mainly impacted the public sector section of the current account (Noureen et al., [2022](#)).

The impact of fluctuations in rate currency and monetary policy shocks on Pakistan's trade balance was examined by Nizamani et al. (2016). Their research sought to ascertain the effects of currency rates and monetary policy on Pakistan's trade balance. The study also examined the underlying effects of the trade imbalance and surplus sectors to avoid aggregation biases. The Impulse Response Functions from Vector Error Correction Models were computed to assess the dynamic correlation among monetary policies, exchange rates, and trade balances (Bhatti, 2023). The results showed that, in the short term, the overall trade balance was improved by shocks to monetary policy, but the industries that produced trade surpluses were negatively affected. These findings also recommended a strict monetary strategy for short-term improvement (Kayani et al., 2023).

Buyangerei and Kim (2013) used the structural vector error correction (SVEC) model to investigate how macroeconomic shocks affected Korea's trade balance and currency rate. The endogeneity between significant macroeconomic variables has prompted a reexamination of conventional theories, including exchange rate overshooting and J-curve effects. The impulse response data confirmed their predictions. A decline in the exchange rate (KRW/foreign) and the appreciation of the Korean Won due to an interest rate shock worsened the trade balance (Bilqees et al., 2023). It was found that the exchange rate overshooting was caused just by its rate shock. In addition, researchers did not find any evidence of the J-curve effect.

The impact on the South African trade balance of contractionary monetary policy and exchange rate appreciation shocks, up to one standard deviation in magnitude, were examined by Noubé and Ndou (2013) using recursive and sign-restriction vector autoregressive models. It was found in the study that the trade balance as a percentage of GDP was significantly reduced for a few quarters by an exchange rate appreciation shock, but this reduction was not permanent. Furthermore, this contrasts the effects of contractionary monetary policy shocks. In addition, it was found that contractionary monetary policy negatively affects the trade balance when it directly influences exchange rates (Ali et al., 2024). This negative impact is most pronounced over five quarters, with a more than 0.01 percentage points decrease.

The relationships among monetary policy shocks, currency exchange rates, and trade balances in five countries that target inflation (ITCs) were investigated by Iverendi and Goluglu (2010). Structural vector error correction models (SVECMs) were used in the investigation, considering long- and short-run limitations. In concise terms, output decreased, the price level decreased, currency value gained, and the trade balance improved due to a contractionary monetary policy shock. Earlier research investigations that had been made to solve the puzzles of trade, pricing, output, and the currency exchange rate had their findings contradicted by this study.

The study undertaken by Fratzscher et al. (2009) aimed to show that monetary policy shocks had a noteworthy effect on the amount and composition of capital flows in the US trade balance. Monetary policy easing led to positive returns for both bonds and stocks. However, a shock to monetary policy easing also led to a shift in the portfolio's composition away from stocks and toward bonds, indicating a conditional negative relationship between bond and stock flow. Furthermore, these shocks led to a negative conditional correlation and a positive conditional connection between equity flows and returns and bond flows and returns, respectively. The findings thus confirmed that decisions about equities investing were motivated by a desire to balance one's portfolio.

Kim (2001) used the VAR model to assess how shocks to monetary policies affected the balance of trade (in terms of volume, unit value, and total values of nominal) for France, Italy, and the United Kingdom. According to the findings, the results were consistent with the expenditure-switching effect despite the limited indication of the J-curve impact.

3 Methodology

The present study employs the Vector Autoregressive model (VAR). It refers to the approach described by Nizamani et al. (2016) to examine the impacts of monetary policies and shocks to the exchange rate on the trade balance in Pakistan. VAR assumes all the variables in the estimation process are endogenous and neglects the condition of having a theory to incorporate the variables in the model. VAR without exogenous variables is represented as follows;

$$an\ the\ By_t = C(L)y_t + \epsilon_t \quad (1)$$

Here, B and C represent the matrices of coefficients, whereas y_t is a vector of all the endogenously assumed variables, in contrast represents the lag structure used and the structural error represented by ϵ_t . Moreover, the reduced form of VAR model is as follows;

$$y_t = A(L)y_t + \mu_t \quad (2)$$

$$\text{While } A(L) = B^{-1}C(L) \text{ and } \mu_t = B^{-1}\epsilon_t$$

The response to impulse function and variance decomposition can be calculated by incorporating the correlation between the valuated residuals and structural unexplained variations, making them the most significant parts of VAR.

$$CapE(\mu, \mu'_t) = (B^{-1}\epsilon_t)(B^{-1}\epsilon_t)' = B^{-1}E(\epsilon_t, \epsilon_t')(B^{-1})' = I \quad (3)$$

It is objectively assumed that the shocks are not correlated, and because of this, the Cholesky decomposition would be able to identify the structural errors. The order of integration amongst the model is I (1) and I (0) so we have used ARDL Vector error correction to analyse the cointegration amongst the variables. The lag length for the model is based on the Akaike Criteria, and the selected lag length of this model is 3.

The Vector error correction form of our model is as follows

$$\Delta y_t = \alpha_0 + \pi y_{t-1} + \sum_{i=1}^n \Gamma_i \Delta y_{t-i} + \sum_{i=1}^n B_i X_{t-i} + \mu_t \quad (4)$$

Vectors of endogenous variables include the trade balance in Pakistan along with monetary policy shocks captured by 6-month T bills, Real Exchange rate measured by real effective exchange rate, Consumer price index is used to incorporate the impact of inflation in the model. In contrast, the industrial production index is used as a proxy of domestic income in the country (Nizamani et al., 2016).

3.1 Data and Variables

Monthly time series data from January 2005 to December 2021 were used. Every piece of information was gathered from Pakistan's state bank and the International Financial Statistics. To approximate the country's domestic income, we have used the industrial output index, with the CPI serving as a proxy for inflation. Six months' worth of Treasury bills and effective exchange rate data were utilized to determine the impacts of the monetary policy shock and exchange rate.

4 Results

The stationarity of the data has been assessed using the Zivot Andrew unit root test with a structural break. It has been confirmed that the series has orders of integration of I (0) and I (1). Moreover, the results can be found in Table 1. The subsequent stage in estimating VAR involves carefully selecting an appropriate lag duration, particularly in the context of time series data utilized in this work. The lag length method is too short that it will fail to represent the actual dynamics of the model accurately. However, using a lag length that is shorter would lead to a decrease in the number of degrees of freedom. Different lag lengths are suggested in table 2 while we have chosen the lag length based on Akaike criteria, and optimal lags for our study are 3. We have used the LM

test to check the existence of the autocorrelation, and the results revealed that there is no problem of serial correlation in our data, while to address the heteroscedasticity issue, the Glesjer test has been used, which also suggests there is no problem of heteroscedasticity in our data.

Table 1: Zivot Andrew Unit Root Test

Variable	Test Stats	Critical Values	Order of Integration	Peak Point
Trdblcn	-6.922148	-4.93	I(0)	Nov 2008
RER	-11.49141	-4.93	I(1)	Apr 2017
Tbill	-12.75858	-4.93	I(1)	Dec 2008
IPMI	-5.054236	-4.42	I(0)	Jan 2019
CPI	-7.442591	-4.93	I(1)	Jan 2019

Table 2: Criteria of Lag Length

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-587.268	NA	0.000299	6.074545	6.158468	6.108525
1	-358.893	442.6964	3.71e-05	3.988646	4.492185*	4.192523
2	-315.603	81.69608	3.08e-05	3.801056	4.724210	4.174830*
3	-281.167	63.22164	2.80e-05*	3.704273*	5.047042	4.247944
4	-261.609	34.90237	2.97e-05	3.760095	5.522479	4.473663
5	-240.883	35.92536	3.11e-05	3.803929	5.985929	4.687395
6	-224.002	28.39517	3.40e-05	3.887198	6.488813	4.940561
7	-195.134	47.07735*	3.30e-05	3.847524	6.868755	5.070785
8	-177.901	27.21838	3.61e-05	3.927192	7.368037	5.320349

ARDL VECM confirmed the long relationship among the variables. At the same time, the negative sign of the coefficient shows that the previous period's disequilibrium has been corrected, which in turn means that convergence is found. The coefficients of ARDL ECM show that around 23% of previous periods of disequilibrium have been corrected within a year. Results of ARDL VECM are given in table 3.

Table 3: ARDL Error Correction Model Results

ECM Regression		
Variable	Coefficient	t-Statistic
D (TRDBLN (-1))	-0.119207	-1.850418
D(DCPI)	0.000235	0.108059
D(IPMI)	0.00011	0.368045
CointEq (-1) *	-0.233111	-6.65451

The recursive and recursive square test have the stability of coefficients in our model. Although the recursive square shows that the stability of our coefficients is almost with the border lines, no major instability has been observed.

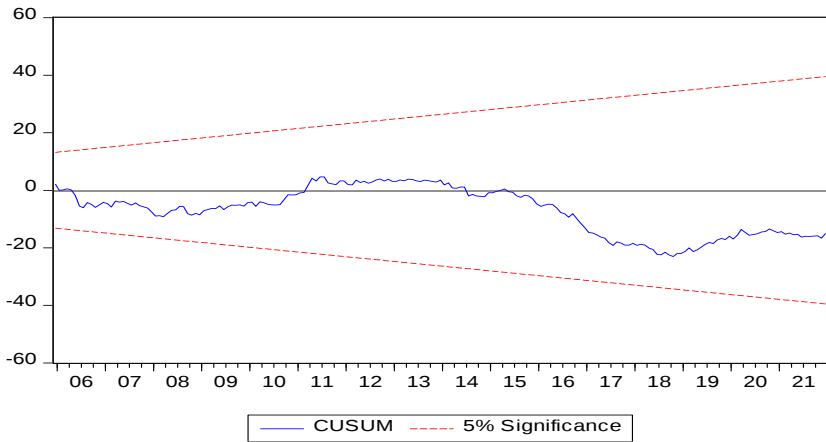


Figure 1: Recursive Square Graph

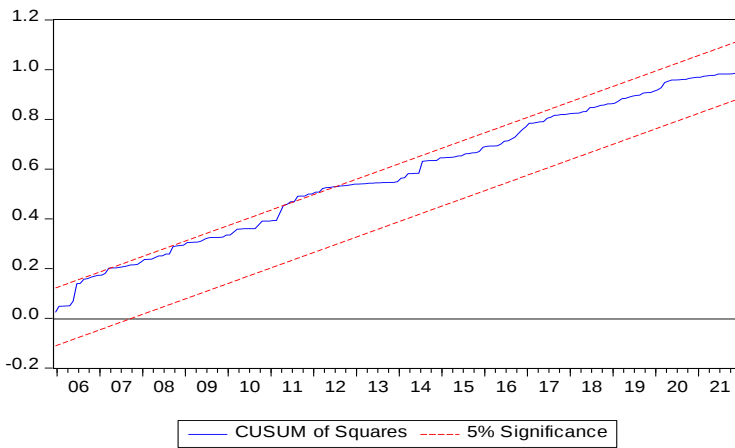


Figure 2: Recursive Sum of Square Graph

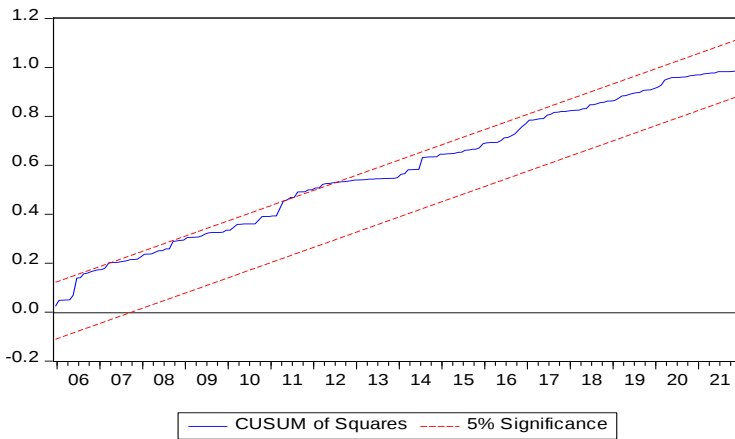
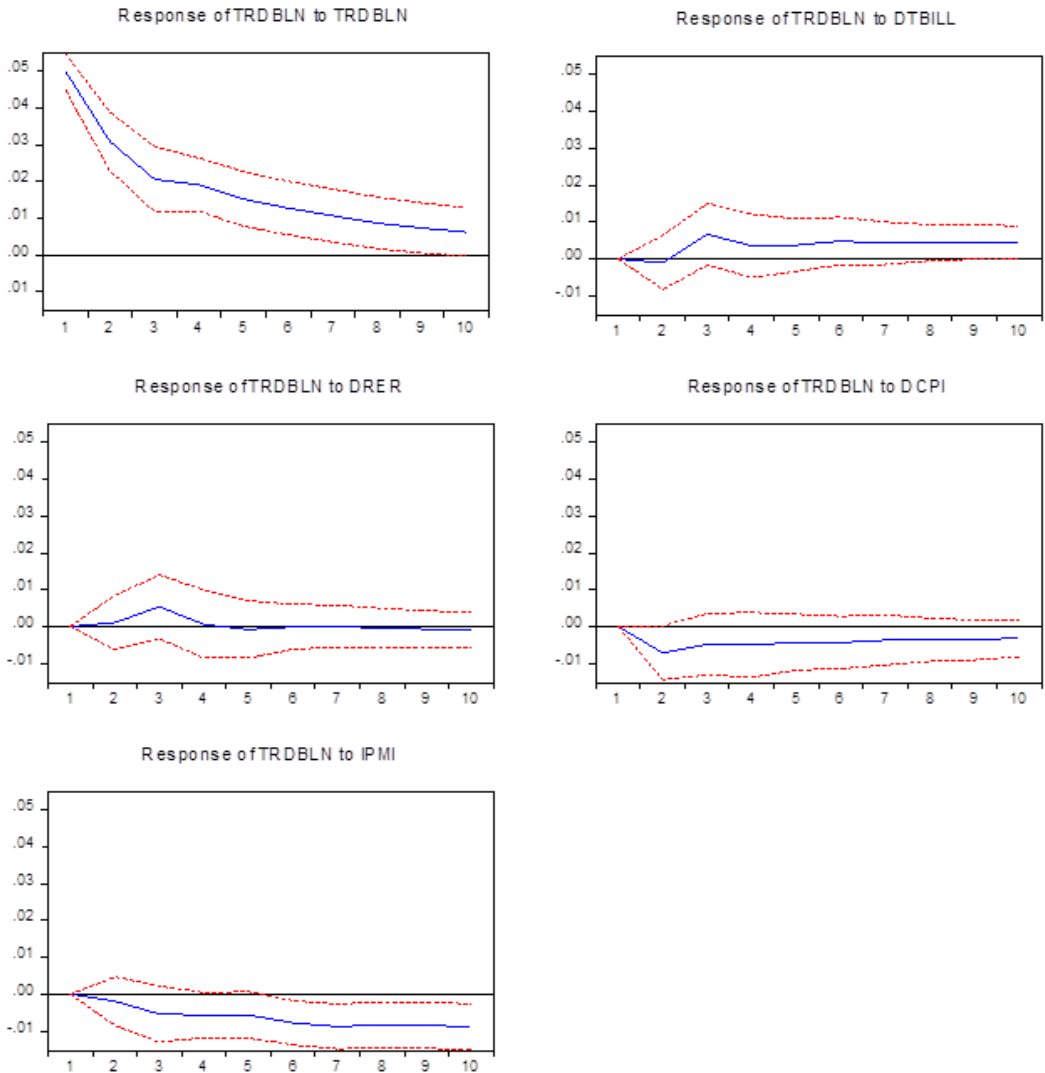


Figure 3: Responses of Trade Balance to Impulses



The trade balance has exhibited a modest positive reaction to the implementation of contractionary monetary policy, as revealed by the impulse response function analysis. This suggests that a one percentage point rise in the interest rate results in a 0.005 per cent enhancement in the overall trade balance of Pakistan. And this positive effect emerged in the 2nd month and continued throughout. This shows that the contractionary monetary policy significantly affects the country's economy; it decreases the volume of imports, which leads to improvement in the trade balance, which has been categorised as the income effect of monetary policy. Initially, the trade balance showed a significant positive impact on the trade balance, and depreciation in the real effective exchange rate improved the trade balance in the country by 0.005 per cent for one month. After that, the impact of shock neutralized and did not show a significant measurable impact on the trade balance. The shock of the industrial production index, used as a proxy to capture domestic income in Pakistan, has negatively impacted the trade balance. However, this shows that as the income rises, the people enhance the demand for imported goods, which negatively affects the trade balance. Likewise, the shock of CPI also showed a negative impact on the trade balance, which is again in line with existing theories. As the domestic prices rise, the external demand for goods falls,

resulting in a decline in the trade balance.

Table 4: Granger Causality Results

Testing for pairwise Granger causality

Date: 02/19/23 Time: 11:52

Sample: 2005M01 2021M12

Lags: 2

Null Hypothesis:	Observation	F-Statistic	Prob.
TRDBLN is not Granger Caused by DTBILL.	201	0.62038	0.5388
DTBILL is not Granger Caused by TRDBLN.		4.32135	0.0146
TRDBLN is not Granger Caused by DRER.	201	0.17291	0.8413
DRER is not Granger Caused by TRDBLN		1.80790	0.1667
TRDBLN is not Granger Caused by DCPI.	201	2.57833	0.0785
DCPI is not Granger Caused by TRDBLN.		3.14491	0.0453
TRDBLN is not Granger Caused by IPMI.	202	4.61065	0.0110
IPMI is not Granger caused by TRDBLN.		4.40226	0.0135
DTBILL is not Granger Caused by DRER.	201	4.54361	0.0118
DRER is not Granger Caused by DTBILL.		0.00209	0.9979
DTBILL is not Granger Caused by DCPI.	201	6.76654	0.0014
DCPI is not Granger Caused by DTBILL.		3.98339	0.0201
DTBILL is not Granger Caused by IPMI.	201	3.11072	0.0468
IPMI is not Granger caused by DTBILL.		0.62173	0.5381
DRER is not Granger Caused by DCPI	201	0.54356	0.5816
DCPI is not Granger Caused by DRER.		4.87191	0.0086
DRER is not Granger Caused by IPMI.	201	1.40381	0.2481
IPMI is not Granger caused by DRER.		0.05269	0.9487
DCPI is not Granger Caused by IPMI.	201	6.55168	0.0018
IPMI is not Granger Caused by DCPI.		8.43596	0.0003

The Granger Causality test has shown that contractionary monetary policy and trade balance, inflation and trade balance, domestic income and trade balance, inflation and contractionary monetary policy and inflation and domestic income have shown dual causality. While it has also been observed that depreciation in currency captured by real effective exchange rate causes contraction in the monetary policy, an increase in domestic income causes contractionary monetary policy and depreciation in currency causes inflation in Pakistan.

Table 5: Variance Decomposition of Dependent Variable (Balance of Trade)

Period	S.E.	TRDBLN	DTBILL	DRER	DCPI	IPMI
1	0.049937	100	0	0	0	0
2	0.059155	98.39803	0.027705	0.034467	1.437294	0.102507
3	0.063641	95.49828	1.142426	0.745516	1.810843	0.802933
4	0.06696	94.3794	1.314352	0.681193	2.184987	1.440068
5	0.069135	93.38091	1.529149	0.652076	2.423623	2.014242
6	0.071025	91.69615	1.918442	0.617973	2.663204	3.104233
7	0.072582	89.98656	2.18086	0.591852	2.802683	4.438046
8	0.073793	88.44833	2.462961	0.576158	2.952986	5.559563
9	0.074869	86.88338	2.771464	0.568275	3.103107	6.673772
10	0.075851	85.32605	3.051303	0.56922	3.190002	7.863429

The variance decomposition results have shown that trade balance has a major share in the decomposition of its variance along with that other key variable, particularly domestic income and inflation, shows high increasing share in the decomposition of variance of trade balance while the

monetary policy shock shown positive increasing share in the decomposition of variance of trade balance while exchange rate shock shown decreasing share in the decomposition of variance of trade balance in Pakistan.

5 Conclusion

This study has assessed the impact of shocks from monetary policy and the rate of foreign exchange on the trade balance inside the nation, and results have shown that contractionary monetary policy has shown a positive impact on the trade balance, while initially, the depreciation of Pakistani rupee has affected the trade balance positively by capturing the external demands but later own its effect has been neutralised. Our finding also suggest that Pakistan has yet to get any significant benefit from currency depreciation this means that instead of currency depreciation we should go for currency stabilization.

6 References

- Ahmad, M., Jabeen, G., Shah, S. A. A., Rehman, A., Ahmad, F., & Işık, C. (2022). Assessing long- and short-run dynamic interplay among the balance of trade, aggregate economic output, real exchange rate, and CO2 emissions in Pakistan. *Environment, Development and Sustainability*, 24(5), 7283–7323. <https://doi.org/10.1007/s10668-021-01747-9>
- Alexander, S. S. (1952). Effects of a Devaluation on a Trade Balance. *Staff Papers-International Monetary Fund*, 2(2), 263–278.
- Ali, C. I., Ullah, S., Ahmed, U. I., Rehman, A. U., Mehmood, H. Z., Yasin, M., & Raza, M. (2023). Short and Long Run Effects of Monetary Policy on Food Inflation: A Study of Pakistan. *Journal of Economic Impact*, 5(2), 146–154. <https://doi.org/10.52223/j.econimpact.2023.5203>
- Ali, M. S., Ahmad, I., & Faizan, M. (2024). Uncovered interest rate parity phenomenon and determinants of domestic interest rates: An analysis of Pakistan and China economies. *Future Business Journal*, 10(1), 35. <https://doi.org/10.1186/s43093-024-00320-w>
- Asadullah, D.-M., & Tabash, M. (2023). Mapping the Causal Connections among Exchange Rate Indicators and Exchange Rate: New Evidence from NARDL Econometric Approach. *Pakistan Business Review*, 25, 171–189. <https://doi.org/10.22555/pbr.v25i2.923>
- Bahmani-Oskooee, M. (1991). Is there a long-run relation between the trade balance and the real effective exchange rate of LDCs? *Economics Letters*, 36(4), 403–407.
- Bhatti, Z. A. (2023). Managing effects of Forex Rate's fluctuation on Pakistan's Trade Balance. *International Journal of Social Science & Entrepreneurship*, 3(3), 81–111. <https://doi.org/10.58661/ijssse.v3i3.180>
- Bilquees, Ayyub, N., & Shah, M. (2023). Macroeconomic impacts of global oil and commodity price shocks on the economy of Pakistan. *Irasd Journal of Economics*, 5(4), 1019–1031. <https://doi.org/10.52131/joe.2023.0504.0176>
- Buyangere, B., & Kim, W. J. (2013). The effects of macroeconomic shocks on the exchange rate and trade balances in Korea. *Korea and the World Economy*, 14(1), 91–119.
- Dornbusch, R. (1976). Expectations and exchange rate dynamics. *Journal of Political Economy*, 84(6), 1161–1176. <https://doi.org/10.1086/260506>
- Fleming, J. M. (1962). Domestic Financial Policies under Fixed and under Floating Exchange Rates (Politiques financières intérieures avec un système de taux de change fixe et avec un système de taux de change fluctuant)(Politica financiară internă sub sisteme de tipuri de schimb fixe sau de tipuri de schimb fluctuante). *Staff Papers-International Monetary Fund*, 9(3), 369–380. <https://doi.org/10.2307/3866091>
- Fratzscher, M., Saborowski, C., & Straub, R. (2009). *Monetary policy shocks and portfolio choice* (Working paper no. 1122). European Central Bank. <https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp1122.pdf>
- Hakimzai, S. N. (2023). The effect of monetary policy shocks on industrial output in Afghanistan.

- Journal of Economics Finance and Accounting*, 10(3), 137–149. <https://doi.org/10.17261/Pressacademia.2023.1812>
- Hsing, Y. (2005). Short-Term Output Fluctuations in Poland: An Application of the Is-Mp-As Model. *The American Economist*, 49(2), 44–50. <https://doi.org/10.1177/056943450504900205>
- Udeaja, E. A., Audu, N. P., & Obiezue, T. O. (2020). The transmission mechanism of monetary policy shocks in Nigeria: The interest and exchange rates channels. *Advances in Social Sciences Research Journal*, 7(9), 283–311. <https://doi.org/10.14738/assrj.79.8927>
- Ivrendi, M., & Guloglu, B. (2010). Monetary shocks, exchange rates and trade balances: Evidence from inflation targeting countries. *Economic Modelling*, 27(5), 1144–1155.
- Kayani, U. N., Aysan, A. F., Gul, A., Haider, S. A., & Ahmad, S. (2023). Unpacking the asymmetric impact of exchange rate volatility on trade flows: A study of selected developed and developing Asian economies. *Plos one*, 18(10), Article e0291261. <https://doi.org/10.1371/journal.pone.0291261>
- Khan, M. A., Khan, Z., & Saleem, S. F. (2023). Monetary policy effectiveness in Asian developing economies: The moderating role of financial sector development. *Journal of Financial Economic Policy*, 15(3), 226–247. <https://doi.org/10.1108/JFEP-01-2023-0021>
- Kim, S. (2001). Effects of monetary policy shocks on the trade balance in small open European countries. *Economics Letters*, 71(2), 197–203.
- Meade, J. E. (1951). *The balance of payments*. Oxford University Press.
- Mirza, N., Naqvi, B., Rizvi, S. K. A., & Boubaker, S. (2023). Exchange rate pass-through and inflation targeting regime under energy price shocks. *Energy Economics*, 124, Article e106761. <https://doi.org/10.1016/j.eneco.2023.106761>
- Mundell, R. A. (1963). Capital mobility and stabilization policy under fixed and flexible exchange rates. *Canadian Journal of Economics and Political Science/Revue Canadienne de Economiques et Science Politique*, 29(4), 475–485.
- Ncube, M., & Ndou, E. (2013). Monetary policy and exchange rate shocks on South Africa's trade balance. In M. Ncube & E. Ndou, *Monetary Policy and the Economy in South Africa* (pp. 113–138). Palgrave Macmillan UK. https://doi.org/10.1057/9781137334152_7
- Nizamani, A. R., Karim, Z. A., Zaidi, M. A. S., & Khalid, N. (2016). The effects of monetary policy shocks & exchange rate on the trade balance of Pakistan. *Prosiding Persidangan Kebangsaan Ekonomi Malaysia Ke, 11*, 606–615.
- Noureen, S., Iqbal, J., & Chishti, M. Z. (2022). Exploring the dynamic effects of shocks in monetary and fiscal policies on the environment of developing economies: Evidence from the CS-ARDL approach. *Environmental Science and Pollution Research*, 29(30), 45665–45682. <https://doi.org/10.1007/s11356-022-19095-0>
- Shahzad, H., Shoukat, A., & Abdullah, M. (2023). Unlocking the secrets of economic growth: Understanding the transmission mechanism of the monetary policy. *Bulletin of Business and Economics (BBE)*, 12(4), 137–149. <https://doi.org/10.61506/01.00159>
- Tarawalie, A. B., & Kpana, K. A. (2022a). Monetary policy, exchange rate fluctuations and trade balance: The Sierra Leone experience. *Modern Economy*, 13(3), 425–441.
- Tarawalie, A. B., & Kpana, K. A. (2022b). Monetary policy, exchange rate fluctuations and trade balance: The Sierra Leone experience. *Modern Economy*, 13(3), 425–441. <https://doi.org/10.4236/me.2022.133023>
- Zahra, A., Nasir, N., Rahman, S. U., & Idress, S. (2023). Impact of exchange rate, and foreign direct investment on external debt: Evidence from Pakistan using ARDL cointegration approach. *iRASD Journal of Economics*, 5(1), 52–62. <https://doi.org/10.52131/joe.2023.0501.0110>