Currency Exchange Rate Volatility: Consequences on International Trade in Pakistan

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ABSTRACT

This study investigates the impact of currency exchange rate volatility on international trade in Pakistan utilizing annual time series data from 1990 to 2022, collected through World Development Indicators (WDI) and Economic survey of Pakistan. The Correlation, ADF unit root test, ARDL bound test and ARDL model techniques have been used to attain the results. The outcomes indicate that there exists strong and moderate correlation between the variables used in the study. Variables used in the study have mixed order of integration and ARDL results portrays that volatility of exchange rate adversely influences international trade in Pakistan. Whereas, the impact of economic growth, population growth rate, inflation rate, and industrialization, appear to be positive statistically significant and expenditures on research and development came out to be insignificant. It is concluded that volatility of exchange rate badly impacts international trade in Pakistan; therefore, policymakers should make the exchange rate stable by using monetary policy tools.

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1. Introduction

International trade is a key element in boosting economic growth and development as the world economy has grown more integrated (Ruhil et al., 2023). The rate of exchange is one of the key factors that influences several businesses, investments, and policy decisions in open economy (Liew, Lim, & Hussain, 2003). Exchange rate fluctuations might impact the labor market and general price level, change the structure of investment and output, result in misallocation of domestic resources and external trade and influence external accounts, all of which might have significant macroeconomic effects on the economy (Auboin & Ruta, 2011; Ozturk, 2006). Changes in rates of interest and inflation, economic performance, political stability, and speculation are some factors that can cause exchange rate volatility (Lal et al., 2023; Liu & Lee, 2022). Exchange rate is also considered as an indicator of the health of the country and affects several aspects of the economy, specifically international trade (Edwards & Cabezas, 2022; Ruhil et al., 2023). Because exchange rates are inherently volatile, de-internationalization could occur due to rising transaction costs and possibly reduced trade interests (Lim & Mandrinos, 2023). According to proponents of fixed exchange rates, exchange rate volatility is an obstacle to achieving potential flows of foreign trade. The goal of the flexible rate of exchange is to make it easier for external sources to adjust the balance of payments (Hwang & Lee, 2005). Grauwe (1988) states that a trader's risk-taking behavior influences how they react to exchange rate risk. The risk-tolerant trader will boost trade today to offset any potential loss of income in the future, while the risk-averse trader will remain neutral. Thus, the final influence of Exchange Rate Volatility (ERV) on flows of trade is assessed by the overall preponderance of risk-tolerant or risk-averse traders (Bahmani-Oskooee & Aftab, 2017).

Longer-term decisions can be impacted by exchange rate volatility, because it can change government sales and procurement policies, the amount of investment allocated, and the volume

of imports and exports. Local consumers and traders might be impacted in the short term, but the balance of payments and the degree of economic activities might be impacted in the long-run. Consequently, the stability of the rate of exchange is something that every government has always sought since it gives business people a chance to plan without worrying about fluctuating expenses and prices for goods and services. However, exchange rate volatility can lead to a detrimental distortion in any economy (Joseph, 2011). Similarly, a variable exchange rate hinders trade, throws off flows of capital, and weakens confidence of investors in investing in a country with significant ERV, impeding economic growth. Consequently, the rate of exchange serves as both the foundation of trade and a crucial macroeconomic policy tool that guarantees the promotion of exports and economic growth (Lotfalipour & Bazargan, 2014). Pakistan has also experienced fluctuations in exchange rates since its independence. The Pakistani rupee is steadily losing value in relation to the U.S. dollar, and the significant variability of the country's currency rate contributes to investors' fear and inefficiencies in financial policy (Khan, Azim, & Haider Syed, 2014). Monetary policy in Pakistan has undergone several phases: First, from 1973 to 1982, when the State Bank of Pakistan (SBP) used a fixed exchange rate system. The SBP implemented a managed float rate of exchange mechanism on January 8, 1982, but the rupee declined. It declined from 12.71 to 51.77 per U.S. dollar between 1982 and 1999. Following that, on May 19, 1999, the SBP implemented a full float market-based system of supply and demand in the foreign exchange market. However, between 2000 and 2008, the value of the rupee fell even further, falling from 58.03 to 62.55 per U.S. dollar. Comparably, Pakistan's exchange rate has experienced significant volatility since 2008. Currently, the economy of Pakistan is also facing high exchange rates due to political instability, low reserves, low exports and high levels of imports. Figure 1 displays the volatile trend of the rate of exchange in Pakistan.

Figure 1: Trend of Real Effective Exchange Rate Volatility in Pakistan (1990-2022)

Source: World Development Indicators(year)
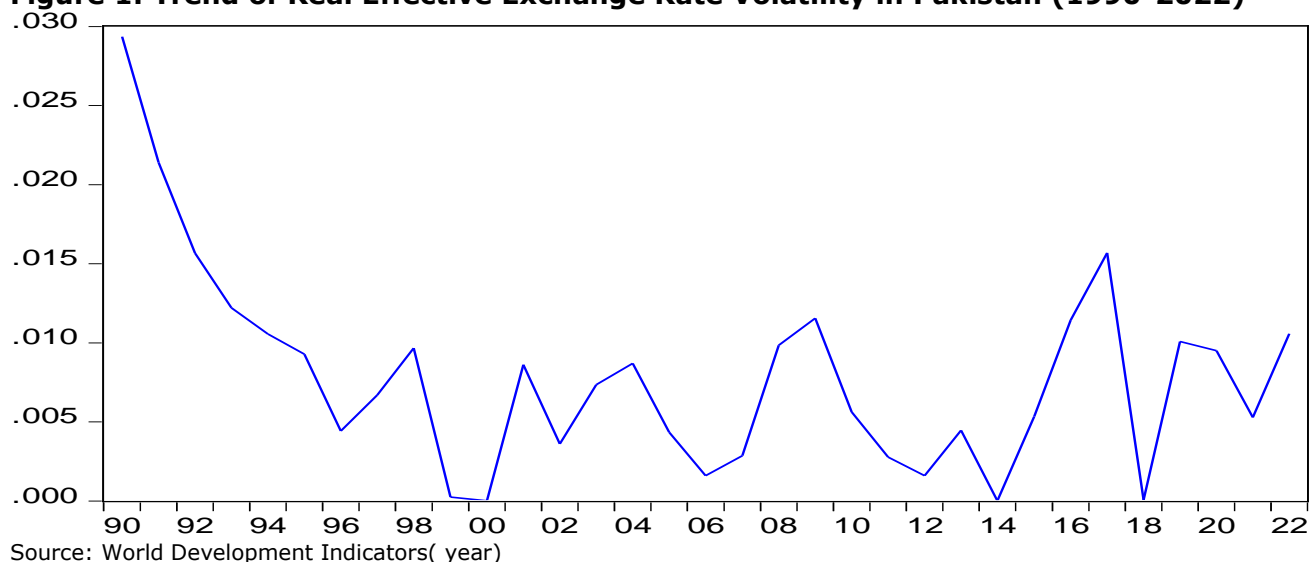
On the other hand, Pakistan is significantly dependent on oil imports as well as contemporary inputs and technology for domestic production and consumption. The country's low foreign reserves and ongoing trade imbalance have strained the external balance tremendously. The exchange rate's volatility also causes fluctuations in trade in Pakistan. The trade trend is similarly erratic, as Figure 2 illustrates. In Pakistan, a few exports and production diversification is experienced despite the nation's high degree of openness to global trade. This leaves it open to unfavorable swings and shocks in global markets, as demonstrated, for example, by the volatility of its economic performance and the swings in trade. Likewise, ERV causes market unpredictability, fluctuations in traders' profit, elevated risk, unpredictable inflation, an unfavorable trade balance, and affects production and costs of transportation (Phan & Juhro, 2018).

Figure 2: Trend of Trade in Pakistan (1990-2022)

Trade (% of GDP)
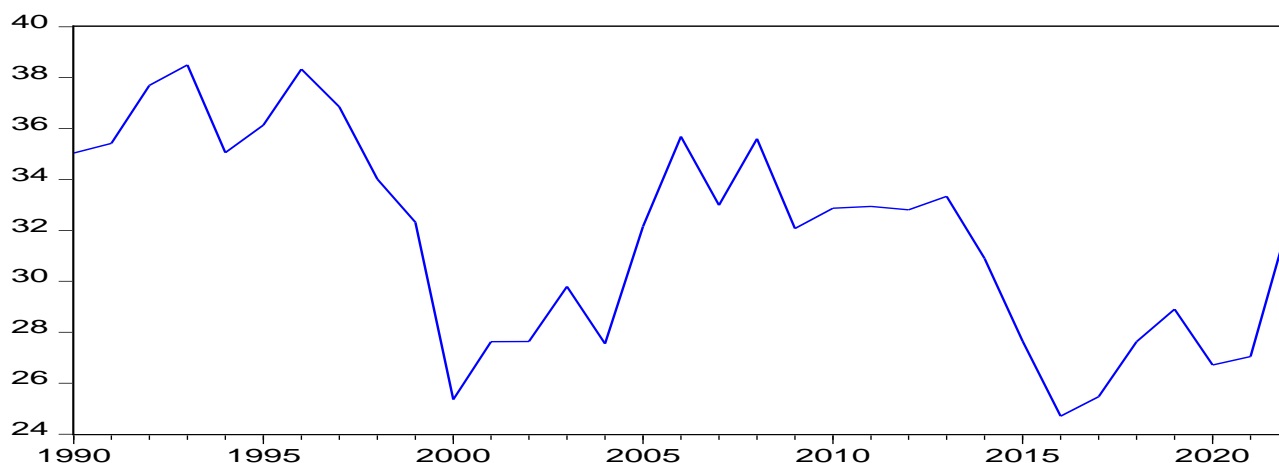
Source: World Development Indicators

The discussion of alternative rate of exchange regimes revolves around the association between the ERV and international trade. Keeping in view the above discussion, this study estimates the effect of ERV on international trade in Pakistan. This analysis will deliver significant implications to the legislators about how the variations in the rate of exchange are responsible for trade and what measures need to be taken to control the exchange rate volatility. The rest of the article is organized as follows: section 2 illustrates the literature review, section 3 is about the data and methodology, section 4 pertains to the results and discussion followed by conclusion and policy implications in section 5.

2. Literature Review

Exchange rate volatility (ERV) and trade associations have undergone extensive analyses since the 1973 failure of the Bretton Woods system. Over the years, the association between trade and ERV has remained elusive despite a vast body of scholarship disputing the nature of the link between the two variables. The extant literature viz; Rasaki and Oyedepo (2023) used data from 1995 to 2020 to inspect the influence of ERV on trade of Nigeria. According to the results of the non-linear ARDL, ERV has no non-linear effect on exports. The non-linear ARDL model, however, showed that ERV has unbalanced long- and short-term effects on imports. The results indicated that a rise in volatility was associated with a fall in imports, and vice versa. Similarly, Balomenou and Pajollari (2022) employed data from 2000 to 2018 to explore the influence of ERV on flows of international trade, including imports and exports. The findings indicated a relationship between ERV and foreign trade between the U.S. and Canada. The outcomes demonstrated that exports and ERV have a beneficial long-run association. There was a long-term impact on imports, although varies with time.

Using data from 2010 to 2019, Truong, Le and Vo (2022) studied the asymmetric influence of ERV on Vietnam's foreign trade. Positive variations in the ERV have a short-term adverse influence on the balance of trade. Conversely, over time, upsurges in the ERV favorably impacts the trade balance. Sambo et al. (2021) examined how exchange rate fluctuation affected trade in Nigeria utilizing data from 1980 to 2019. The analysis exhibited the optimistic impacts of the real rate of exchange on trade , amplified by financial growth. The analysis also exhibited that the unpredictability of foreign capital flows negatively impacted Nigeria's international trade. Using data from 2000 to 2014, Thuy and Thuy (2019) investigated how ERV impacted Vietnam's exports. The ARDL results demonstrated that ERV has a long-term negative adverse influence on volume of exports. According to the J-curve effect, a decrease in the home currency value has a short-term adverse effect on exports but long-term effects are noted as beneficial. Remarkably, Vietnamese export volume declines when remarkably a foreign nation's real wealth rises.

Yakubu et al. (2018) documented the effect of ERV on flows of trade in Nigeria utilizing from 1997 to 2016. The analysis exhibited that ERV has a short-term adverse effect on flows of trade however no long-run significant links were found. Latief and Lefen (2018) explored the impact of ERV on international trade and FDI in developing economies. The results exposed that ERV adversely influences foreign trade and foreign direct investment. Alam, Ahmed and Shahbaz (2018) analyzed the link between the demand for Pakistan's bilateral exports and the fluctuations

in exchange rates from 1982 to 2013. The findings implied that ERV initially harms Pakistani exports' demand to the United States, but it eventually has a favorable effect on exports' demand to Germany. Real effective ERV has no long-term or short-term impact on Saudi Arabia's and the United Arab Emirates' demand for Pakistani products.

The study of Shaikh and Hongbing (2015) examined the effects ERV on trade flows in Pakistan, China ,and India , utilizing data from 1980 to 2013. According to the ARDL results, there was a short-term negative association between ERV and Chinese exports but a long-term positive association between ERV and exports. Nonetheless, the volatility of currency rates has a negative link with the overall volume of trade in Pakistan and India. Similarly, Khan et al., (2014) examined the effects of volatility in both domestic and foreign exchange rates on the export and import demand functions concerning trading partners of Pakistan using data from 1970 to 2009. The findings indicated that volatility inhibited imports and exports when Pakistan used the U.S. dollar for trade with its trading partners. In contrast, when Pakistan dealt with developing countries , using bilateral exchange rates , valued in native currency terms, the import and export demand functions were not influenced by volatility distortions. In the case of Iran, Lotfalipour and Bazargan (2014) scrutinized the influence of real effective ERV on the balance of trade from 1993 to 2011. The authors showed that the Real Effective Exchange Rate (REER) has no discernible effect on the balance of trade. Therefore, it is crucial to emphasize that maintaining Iran's balance of trade with its major trading partners cannot be done only by using real effective ERV(Ahmed, Azhar, & Mohammad; Dler M Ahmed, Z Azhar, & Aram J Mohammad, 2024; Dler Mousa Ahmed, Zubir Azhar, & Aram Jawhar Mohammad, 2024; Mohammad, 2015a, 2015b; Mohammad & Ahmed, 2017).

Aftab, Abbas and Nawaz Kayani (2012) observed the influence of sector-level ERV on Pakistan's export trade utilizing data from 2003 to 2010. The findings demonstrated that relative prices and ERV harmed exports, whereas foreign income had a favorable impact. Saqib (2012) discovered the effect of ERV on trade volume in Pakistan utilizing data from 1981 to 2010. The outcome demonstrated that REER increased Pakistan's export volume. Using data from 2003 to 2010, Yüksel, Kuzey and Sevinç (2012) analyzed the effect of GDP, export prices, and ERV on Turkey's overall exports. The outcomes exhibited that exports and ERV have adverse relationship. It is observed in the literature that the association between ERV and international trade is mixed. Though already, studies have been undertaken to observe the influence of ERV on international trade in Pakistan, in the present scenario when Pakistan is facing a). The worst economic crisis due to the ever low foreign exchange reserves and a resultant exchange rate volatility; b)The economy is badly trapped in IMF's enclaves due to heavy debt burden; c) inflation rate has also been out of control, it is incumbent to undertake afresh study to estimate the impact of ERV on Pakistan's trade. This analysis re-examines the link between ERV and international trade, as Pakistan faces exchange rate fluctuations. Understanding the link between ERV and international trade is important because it influences the country's economic stability, global market competitiveness, and overall economic growth. The study will provide new insights to the policymakers to monitor and mitigate the risks linked to the exchange rate volatility.

3.   Data and Methodology

This study uses time series data of Pakistan from 1990 to 2022 to evaluate the influence of currency ERV on international trade in Pakistan. The data of variables is gathered from the World Development Indicators (WDI) and the Economic Survey of Pakistan. To obtain the objectives of the study, the following model is developed:

$$TR_t = \beta_o + \beta_1 ERV_t + \beta_2 INF_t + \beta_3 RAD_t + \beta_4 IND_t + \beta_5 PGR_t + \beta_6 EG_t + u_t \tag{1}$$

Where TR is international trade (percent of GDP), ERV is exchange rate volatility, INF indicates inflation rate (Consumer price index), RAD exhibits research and development expenditures (percent of GDP), IND indicates industry value-added (percent of GDP), PGR represents (population growth rate), EG expresses economic growth (GDP growth rate), and u_t represents error term. The variable ERV is measured as the standard deviation of the real effective exchange is based on the square of the mean adjusted relative change. This measure of ERV was also utilized by Danmola (2013); Ellahi (2011); Osinubi and Amaghionyeodiwe (2009). The Augmented Dickey-Fuller test (ADF) is used to evaluate the stationary of data,

whereas the ARDL bound test is applied to analyze the long-run cointegration among variables in a model. The ARDL model has several benefits. First, the ARDL technique permits inferences on long-run procedures and can be used irrespective of the variables' stationarity (Harris, 1995). This process can be used irrespective of either the series is I(0), I(1), or fractionally integrated, preventing issues brought about by time series data that is not stationary (Pesaran, 1997; Pesaran, Shin, & Smith, 2001). Lastly, this model can be transformed using a simple linear transformation process to create a dynamic error correction model (ECM) (Banerjee et al., 1993). The ECM combines long-run equilibrium and short-run dynamics without sacrificing long-term information. The long-run ARDL model is shown in equation one, while the short-run ECM model equation is given as follows:

$$\Delta TR = \beta_0 + \sum_{I=1}^{n} \beta_1 \Delta ERV_{t-j} + \sum_{I=0}^{n} \beta_2 \Delta INF_{t-j} + \sum_{I=0}^{n} \beta_3 \Delta RAD_{t-j} + \sum_{I=0}^{n} \beta_4 \Delta IND_{t-j} + \sum_{I=0}^{n} \beta_5 \Delta PGR_{t-j}$$

$$+ \sum_{I=0}^{n} \beta_6 \Delta EG_{t-j} + \gamma_1 ECM_{t-1} + u_{1t}$$

$$(2)$$

Where β_1 to β_6 are short-run parameters, γ_1 indicates the ECM term's coefficient and u_t is the error term.

Figure 3: Methodological Framework of the Study
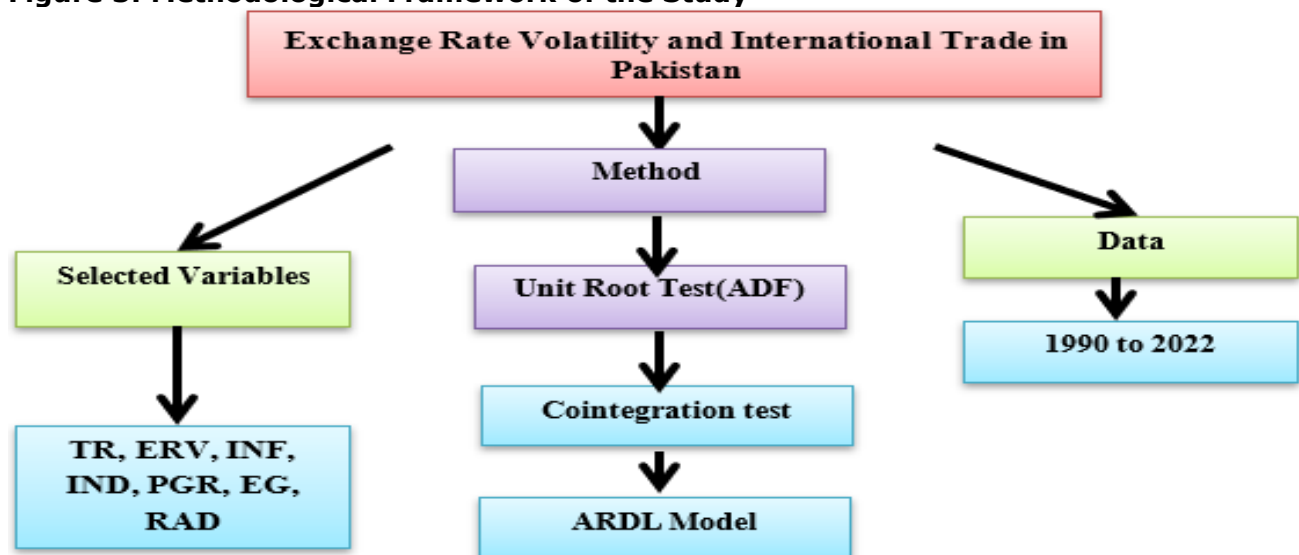
4.   Analysis

Table 1 shows the variable's descriptive statistics. It is found that the mean of trade is 31.791, median value is 32.321, maximum value is 38.499, minimum value is 24.702, S.D. is 4.046, value of skewness (-0.124) displays negatively skewed distribution, and value of kurtosis (1.869) exhibits platykurtic distribution. Similarly, the mean value of ERV is 0.008, median value is 0.007, maximum value is 0.029, minimum value is 0.000, S.D. is 0.006, value of skewness (1.317) exhibits positively skewed distribution, and kurtosis value (5.432) exhibits leptokurtic distribution. In the same way the mean, median ,maximum, minimum, S.D. ,Skewness and Kurtosis values of other variable are given in Table1.

Table 1: Descriptive Analysis of the Study Variables (1990-2022)

Variables	Mean	Median	Maximum	Minimum	S.D.	Skewness	Kurtosis
TR	31.791	32.321	38.499	24.702	4.046	-0.124	1.869
ERV	0.008	0.007	0.029	0.000	0.006	1.317	5.432
INF	8.830	9.063	20.286	2.529	4.363	0.719	3.607
RAD	0.277	0.228	0.633	0.099	0.144	0.928	2.748
IND	20.171	19.923	22.931	17.548	1.662	0.106	1.743
PGR	2.265	2.189	3.297	1.204	0.622	0.000	1.841
EG	4.147	4.433	7.706	-1.274	1.973	-0.461	3.207

Source: Author's Calculations

The correlation matrix exhibits the extent of association between two variables. Table 2 reports the inter-correlalion of the study variables. The Table1 shows that trade is positively correlated to inflation, research and development expenditures, industry value-added, population growth and economic growth, while trade is negatively correlated to exchange rate volatility. The inter-correlation between any pair of variables does not show problem of multicollinearity in the data.

Table 2: Inter-Correlation of the Study Variables (1990-2022)

Variables	TR	ERV	INF	RAD	IND	PGR	EG
TR	1.000						
ERV	-0.212	1.000					
INF	0.543	0.237	1.000				
RAD	0.068	-0.212	0.158	1.000			
IND	0.868	0.357	0.469	-0.024	1.000		
PGR	0.516	0.300	0.124	-0.405	0.508	1.000	
EG	0.074	0.007	-0.199	-0.038	-0.066	-0.097	1.000

Source: Author's Calculations

The Unit root test is vital to determine the stationary of variables. The Table 3 exhibits that the variables exchange rate volatility *(t-test = -4.616; Prob.= 0.001)*, inflation rate *(t-test = -4.667; Prob.= 0.001)*, and economic growth *(t-test = -4.317; Prob.= 0.002)* are integrated at order (0)whereas the variables trade *(t-test = -5.320; Prob.= 0.000)*, research and development expenditures *(t-test = -15.204; Prob. = 0.000)*, industry value-added *(t-test = -6.344; Prob.= 0.000)*, and population growth rate *(t-test = -4.687; Prob.= 0.001)* are integrated at 1st order. As a result, the mixed integration order recommends the use of ARDL model and is critical for long-run parameter's estimations.

Table 3: Unit Root Estimates

Variables	Level		1st Difference		Results
	t-test	Prob.	t-test	Prob.	
TR	--	--	-5.320	0.000	I(1)
ERV	-4.616	0.001	--	--	I(0)
INF	-4.667	0.001	--	--	I(0)
RAD	--	--	-15.204	0.000	I(1)
IND	--	--	-6.344	0.000	I(1)
PGR	--	--	-4.687	0.001	I(1)
EG	-4.317	0.002	--	--	I(0)

Source: Author's Estimations

To estimate the long-run cointegration in a model, ARDL bound test is utilized. Table 4 demonstrates that the F-statistic (6.5758) is greater than the upper bound values at one percent significance level; therefore, it advocates that there is an existence of long-run cointegration in the model so we can progress to the ARDL model estimation.

Table 4: Bound Test Outcomes

Null Hypothesis: No levels of relationship				
Test	**Value**	**Sig.**	**I(0)**	**I(1)**
F-statistic	6.5758	10%	1.99	2.94
K	6	5%	2.27	3.28
		2.5%	2.55	3.61
		1%	2.88	3.99

Source: Author's Calculations

The ARDL long-run estimates of the influence of ERV on international trade in Pakistan are presented in Table 5. The analysis exhibits that ERV is adversely and considerably (at a 5 percent level) associated to international trade in Pakistan. The coefficient value exhibits that as exchange rate volatility increases by one unit, international trade declines by -1.8851 units. It suggests that exchange rate fluctuations lessen the advantages of international trade by raising risks about potential earnings. Because not all traders have access to forward markets, the exchange rate risk is typically not hedged for every country; therefore, ERV adversely affects international trade (Lotfalipour & Bazargan, 2014; Ozturk, 2006). These results are also in line with (Latief & Lefen, 2018; Sambo et al., 2021). Similarly, inflation is also an imperative factor

to affect international trade. The outcomes demonstrate that INF is positively and significantly (at a one percent level) associated to international trade. The value of coefficient displays that as the inflation rate increases by one unit, the international trade also increases by 0.6446 units. It implies that enhancement in domestic prices leads people to buy imported goods (when exchange rates become stable), leading to an increase in international trade (Dorrance, 1965). However, the exchange rate is significantly increasing in Pakistan, which is also responsible for inflation, but due to depreciating exchange rates, domestic goods become cheaper for foreigners; therefore, it also increases the exports and thus international trade in a country might benefit the country if volume of exports becomes very high. These outcomes are also supported by Islam (2013). Industrialization is a strong factor in international trade of a country. The results also show that industrialization is directly and substantially (at a 1 percent level) related to international trade in Pakistan. The value of coefficient displays that as industrialization improves by one unit, international trade also surges by 1.2398 units. It implies that the industrial sector's increased output greatly impacts the export industry, which also accelerates trade openness (Tahir, Hasnu, & Ruiz Estrada, 2018).

The value of coefficient of variable population indicates positive and significant effect of international trade. The Table displays that as the population increases by one unit, the international trade also enhances by 1.5138 units. It suggests that economies with a higher population have higher aggregate demand, enhancing international trade in a country. This result is in line with results driven by Saber (2010);(Mandrinos & Lim, 2023). The Table also indicates that economic growth is positively and significantly (at a one percent level) associated to international trade in Pakistan. The value of coefficient displays that as economic growth improves by one unit, international trade also rises by 1.1460 units. The results imply that increased economic growth boosts a country's degree of foreign trade by increasing incomes and creating new local markets due to increased aggregate demand. Therefore, a robust financial system is anticipated to promote global trade indirectly through economic growth (Tahir, Hasnu, & Ruiz Estrada, 2018; Yakubu et al., 2018; Yanikkaya, 2003). These results are also supported by Alam, Ahmed and Shahbaz (2018); Hassan and Aljarallah (2021); Ngouhouo, Nchofoung and Njamen Kengdo (2021).

Table 5: ARDL Long-Run Error Estimates (1990-2022)

DV: International Trade

Variables	Coefficient	S.E.	t-Stat.	Prob.
ERV	-1.8851	0.7139	-2.6403	0.0185
INF	0.6446	0.1585	4.0660	0.0010
RAD	1.4248	3.5794	0.3980	0.6962
IND	1.2398	0.2768	4.4789	0.0004
PGR	1.5138	0.7170	2.1111	0.0520
EG	1.1460	0.3422	3.3487	0.0044
C	-5.4535	4.3250	-1.2609	0.2266

Source: Author's Calculations

The short-run error correction model (ECM) is important to analyze the speed of adjustment towards equilibrium in case of short-term disturbances. ECM term is found to be negative (-0.9543) and statistically significant (at 1 percent level). Therefore, it implies that at the rate of 95.43 percent, errors become adjusted towards long-run equilibrium in case of short-term disturbance.

Table 6: ARDL Short-Run Error Correction Estimates

DV: International Trade

Variable	Coefficient	S.E.	t-Stat.	Prob.
D(INF)	0.2636	0.0682	3.8661	0.0015
D(RAD)	-3.7202	1.2720	-2.9246	0.0105
D(IND)	1.2436	0.1838	6.7647	0.0000
D(PGR)	-2.8341	1.0469	-2.7070	0.0162
D(EG)	0.1896	0.0817	2.3196	0.0349
ECM(-1)	-0.9543	0.1086	-8.7838	0.0000

Source: Author's Calculations

To address the issues of autocorrelation, heteroskedasticity, residual normality, and model misspecification several diagnostic tests are applied. TheTable 7 displays no issue of autocorrelation and heteroskedasticity in the model, as indicated by the Breusch-Godfrey and

Breusch-Pagan-Godfrey tests, respectively. Similarly, the Jarque-Bera test indicates that the residuals are normally distributed. Lastly, the Ramsey-Reset test specifies that the model is correctly specified.

Table 7: Model Diagnostic Estimates

Problem	Test	Statistic	Prob.	Outcomes
Autocorrelation	Breusch-Godfrey	0.7841	0.4769	Not Exists
Heteroskedasticity	Breusch-Pagan-Godfrey	0.7457	0.7115	Not Exists
Residuals Normality	Jarque-Bera	1.5592	0.4585	Normally Distributed
Model Misspecification	Ramsey RESET	0.1294	0.7244	Correctly Specified

Source: Author's Calculations

Lastly, to analyze the model's dynamic stability, the OLS recursive estimates of CUSUM and CUSUM squares are used. The fitted lines are between critical lines at the five percent significance level, as shown in Figure 3; therefore, it is suggested that the model employed in the analysis is dynamically stable.

Figure 3: Model Stability Analysis
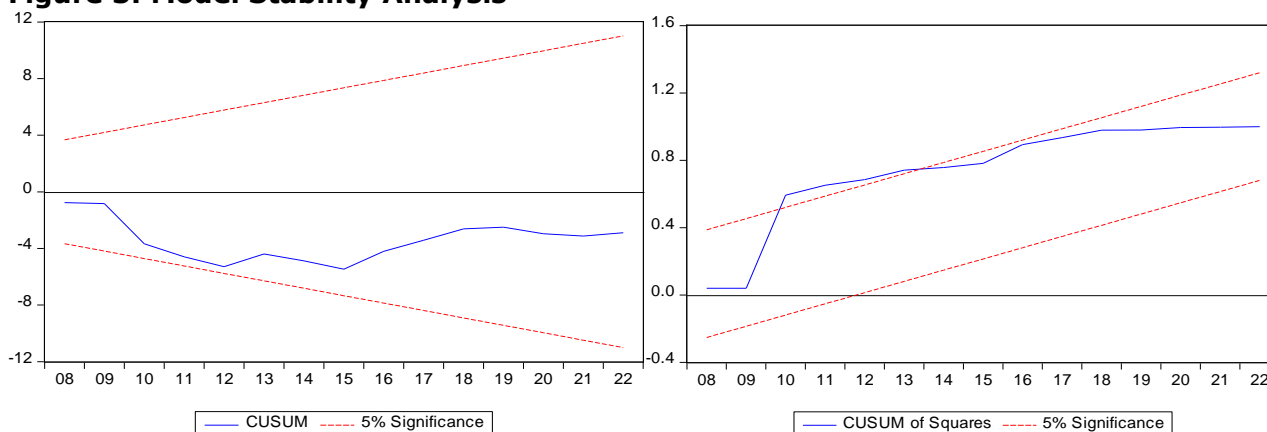
Source: Author's Estimations

5. Conclusions and Recommendations

Pakistan is significantly dependent on international trade to accelerate its economic development; however, changing exchange rates (ERV) badly impact international trade and Pakistan's economy. Understanding the association between ERV and international trade is crucial; therefore, this study analyzes the influence of ERV on international trade in Pakistan. For this purpose, time series data of Pakistan from 1990 to 2022 is used. The ADF test, ARDL bound test and ARDL model are applied to the data for analysis. The ADF test exhibits that the variables ERV, inflation rate, and economic growth are integrated at order level I(0), while the variables trade, research and development expenditures, industry value-added, and population growth rate are integrated at 1st order I(1). The ARDL long-run outcomes suggest that ERV adversely influences international trade in Pakistan because exchange rate fluctuations lessen the advantages of international trade by raising risks about potential earnings. Because not all traders have access to forward markets, exchange-rate risk is typically not hedged for every country; therefore, exchange-rate volatility negatively influences international trade (Lotfalipour & Bazargan, 2014; Ozturk, 2006). The other variables, economic growth, population growth rate, inflation rate, and industrialization, are found to be encouraging factors of trade in Pakistan, while research and development expenditures are found to be positive but insignificant factors of trade in Pakistan. In view of outcomes, it is proposed that ERV harmfully impacts Pakistan's international trade. As a result, policy makers should consider putting exchange rate stabilization measures into place. This can entail managing currency swings and lowering volatility by interventions in the foreign exchange markets or by using monetary policy tools.

The study has also some limitations. First, the study considers ERV, economic growth, population growth rate, inflation, and research and development expenditures as international trade factors in Pakistan. However, future studies can also incorporate political instability and institutional quality as a factor of international trade because these variables are essential and also responsible for ERV, international trade, and the progress of the economy. Secondly, the study only utilized the data of Pakistan, but future studies can conduct cross-country comparisons

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and utilize the panel dataset of countries, especially, developing countries, to get comprehensive results. Lastly, this study applied the ARDL model for data analysis, but ERV can move in positive and negative directions; therefore, the nonlinear influence of ERV on international trade can also be observed in the case of Pakistan.

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