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The Effect of Monetary Policy on Import, Export, and Foreign Direct Investment: An Empirical Investigation

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Abstract
This study investigated the effect of monetary policy determinants upon Pakistani export, import, and foreign direct investment using annual data for the period 1980 to 2021. The Bond cointegration tests showed the existence of a long-term relationship among imports and the other variables. Upon analyzing the import model, it was discovered that in the short term, variables such as the exchange rate and money supply exert a significant influence on imports. Conversely, over a prolonged period, the currency rate, inflation rate, and money supply all exert positive and statistically significant impacts on imports. In the export model, the previous values of export and money supply had a favorable impact, though it was not statistically noteworthy. Conversely, the discount rate and exchange rate showed a detrimental effect, but it was not statistically significant. The inflation rate exerted a substantial and favorable influence on exports. Overall, the study's findings deepen our understanding of the complexities of global commerce and provide important perspectives for both policymakers and practitioners in properly overseeing trade agreements. The findings demonstrate the presence of enduring relationships between the variables and offer helpful information regarding the immediate and long-term effects of different variables on imports and exports. These insights are particularly crucial for comprehending the intricacies of monetary policy and trade policy within the specific framework of Pakistan.
Keywords: Monterey Policy, Export, Import, FDI, Short-run, Long-run

1. Introduction

State Bank of Pakistan is responsible for the development and implementation of fiscal policy in Pakistan (SBP). Fiscal policy plays a crucial role in influencing aggregate demand, working alongside fiscal and other relevant measures to foster sustainable growth without causing inflation. Based on the state of aggregate demand, the economy has the potential to operate at various levels of national income and employment, as long as it remains within the production frontier. Insufficient aggregate demand can result in unemployment, as seen in Pakistan during the 1990s, which was considered a challenging period for the country. On the other hand, excessive demand can lead to inflation, as witnessed in the mid-2000s when some economists believed that the Pakistani economy was overheating, causing double-digit inflation from FY08 to FY12. An economy's total level of demand is influenced by factors such as the availability and price of credit and money. This, in turn, affects both investment and consumer expenditure. Similar to an economist, the SBP has the power to influence the rate and accessibility of money and credit. This is done through adjustments in the policy rate and liquidity ratios, such as cash reserves requirements, which in turn impact aggregate demand. If aggregate demand is low, increasing the money supply and making credit more accessible and affordable can help boost national income and employment. On the other hand, once full employment is reached, it will be important to control future increases in money and credit to prevent inflation. This is especially true if there is no improvement in productivity, as it could lead to an excess demand situation. The economy's external accounts are influenced by internal inequalities within a country. Some aspects of monetary policy also play a part in addressing external imbalances. During periods of deteriorating balance of payments and/or increasing international interest rates, it may be necessary to implement higher policy rates. This is done to discourage foreign investors from pulling out their short-term investments and to alleviate strain on the country's foreign exchange reserves. It has the potential to both discourage the outflow of foreign funds and attract them, thereby assisting in financing a payments deficit and safeguarding foreign exchange reserves from depletion. Just like an economist, the SBP releases monetary policy statements to communicate policy and monetary management initiatives in Pakistan. For this study, we will examine Pakistan's monetary policy and its impact on imports, exports, and foreign direct investment.

The legislative basis for Pakistan's monetary policy framework is established by the State Bank of Pakistan (SBP) Act of 1956. Based on the readings from SBP publications, it is evident that the SBP places importance on maintaining price stability and promoting economic growth, while also considering the exchange rate. The Act also includes provisions for the operational mechanism of monetary policy (MP) and the independence of the central bank. It also establishes a framework for the interaction between the monetary and fiscal authorities, namely the SBP and the government. The Act assigns the responsibility to the SBP to oversee and manage the monetary and credit system of Pakistan, with the aim of promoting its growth to ensure stability in the economy and maximize the utilization of the country's productive resources. The SBP has the choice of selecting a monetary policy framework to achieve these broad goals. Price stability is a direct result of maintaining stability in the monetary system. Section 9A (a) of the Act mandates that the State Bank align its monetary operations and credit policies with the government's goals for real GDP growth and inflation. The priorities of the SBP have shifted over time, from focusing on economic growth to addressing the balance of payments and now to tackling inflation. The government of Pakistan regularly discloses its annual inflation goal, and the SBP subsequently provides the public with inflation projections through its prominent publications, such as monetary policy announcements. Throughout Pakistan's history, the objectives of monetary policy have remained consistent. However, there have been changes in the policy components such as the intermediate aim, instrument(s) of choice, and control. Have undergone significant changes over time. According to Zaidi (2006), Pakistan's monetary policy was seen as discretionary by the mid-2000s. Over the past few years, there have been significant efforts to enhance the transparency and credibility of monetary policy. This has been achieved through the adoption of committee-based decision-making and the regular release of monetary policy announcements.

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This study is conducted to test the following hypothesis**;**

(a) H_0: Monterey policy variables does not have any effect on export

H_1: Monterey policy variables does have effect on export

(b) H_0: Monterey policy variables does not have any effect on import

H_1: Monterey policy variables does have effect on import

(c) H_0: Monterey policy variables does not have any effect on FDI

H_1: Monterey policy variables does have effect on FDI

This study's findings are anticipated to enhance our comprehension of international trade dynamics, specifically within the context of Pakistan. It also provides information regarding the associations and dynamics among the various variables, offering valuable implications for policymakers and practitioners involved in the management of trade relationship. These insights can provide valuable information for decision-making processes regarding fiscal policy and international trade strategies. In addition, this study will also enhance our understanding of the connections, interactions, and variables that impact global trade, particularly in the case of Pakistan. The findings offer valuable insights for policymakers and practitioners, serving as a guide for trade management strategies and policy decisions. The current study is organized into five sections in addition to the introduction. The second section reviews the relevant studies conducted in the past, while the third section summaries the methods to carry out the study. The fourth section discusses the findings and facilitates a discussion, and the final section concludes the study.

2. Review of the Literature

There has been considerable attention from researchers and policy makers regarding the correlation between fiscal policy and foreign trade. Having a deep understanding of how monetary policy impacts imports, exports, and foreign direct investment (FDI) is absolutely essential when it comes to formulating effective economic strategies and fostering sustainable long-term economic growth. As a market research analyst, this literature review will thoroughly examine and summarize previous empirical studies regarding the impact of monetary policy on imports, exports, and foreign direct investment. Several studies have investigated the influence of monetary policy on imports. Based on empirical research, it has been observed that when a contractionary monetary policy is implemented, there is usually a decrease in import levels. This policy is typically characterized by higher interest rates or a reduction in the money supply.

In a study conducted by Ali et al. (2015), the researchers investigated the impact of inflation, interest rates, and money supply on the fluctuations in currency rates in Pakistan. A thorough analysis was conducted using monthly data from July 2000 to June 2009 to explore the correlation between various factors, considering both short-term and long-term trends. They conducted an analysis by utilizing Johansen Cointegration tests, specifically the trace test and eigenvalue, and implementing the Vector Error Correction Model (VECM). Employing the Granger causality test and the Impulse Response Function (IRF), we thoroughly analyzed the impact and responses of variables on each other. There is a clear connection between inflation and exchange rate volatility, both in the short term and the long term, as revealed by the study's findings. When there is a rise in the money supply and interest rates are on the upswing, it usually impacts the price level, leading to inflation. As a result, there is often an increase in the volatility of exchange rates. Just like a market research analyst, Jawaid et al. (2011) delved into the impact of monetary, fiscal, and trade policies on the economic progress of Pakistan. The researchers analyzed annual time series data from 1981 to 2009. These factors are commonly used as indicators for monetary, fiscal, and trade agreements. Based on the analysis of cointegration and error correction models, it becomes evident that fiscal and monetary policies have a significant and positive impact on both long-term and short-term economic growth. In Pakistan, it was found that monetary policy had a higher level of effectiveness compared to fiscal policy, revealing a parallel trend. Research findings indicate that trade policy does not exert any influence on economic growth, irrespective of the time frame considered. Based on the findings, it was recommended to the policymakers that they prioritize monetary policy to ensure the economic growth of the country. Ahmad et al. (2010) examined the relationship between stock returns, interest rates, and exchange rates in the Pakistani economy. The collected data encompasses details on short-term interest rates, exchange rates (Rs/US $), and stock returns (KSE-100) from 1998 to 2009. Using a multiple regression model, the researchers analyzed how changes in interest rates and exchange rates affected stock returns. Changes in interest rates and currency rates had a significant impact on stock returns, as observed. Chaudhary et al. (2012) conducted a study that explored the connections between monetary policy, inflation, and economic growth in Pakistan from 1972 to 2010. They utilized co-integration and causality analysis to examine the connections, both in the long-term and short-term. According to the study, several factors including loans to the private sector, financial depth, real exchange rate, and budget deficit were found to have a significant impact on Pakistan's real GDP. There is a reciprocal association between real GDP and real exchange rate, as revealed by the pair-wise Granger Causality analysis. The extent of financial depth (M2GD), domestic investment (CREDIT), and the budget deficit (BDEF) are significantly influenced by the level of real GDP. The exchange rate plays a significant role in shaping the financial depth and annual deficit indicators. The findings align with the established empirical research.

In a study conducted by Benita and Lauterbach (2007), they analyzed the fluctuations in the exchange rate between the US dollar and 43 different currencies over a period of 11 years, from 1990 to 2001. A clear correlation was found in the study between fluctuations in exchange rates, real interest rates, and the level of engagement by central banks. However, it is important to recognize that these positive connections are likely due to a difference between countries. When countries experience significant exchange rate volatility, they tend to have higher real interest rates and rely more on central bank intervention. According to their analysis, the influence of interest rates and central bank involvement on exchange rate volatility was found to be moderate. Exchange rate volatility can be attributed to statistical and macroeconomic factors. In his influential book "Inflation: Causes and Consequences" published in 1968, Friedman argued that adopting a sustained restrictive monetary policy could effectively address the issue of inflation. By examining the historical connection between the money supply and economic output, one can gain insight into the current rate of price changes, as suggested by the monetarist model. In a study conducted by De Silva (1977), the relationship between inflation and the country's significant debt was analyzed. Similarly, Hallman et al. (1991) focused on assessing the

effectiveness of the p-star model. They argued that the p-star model demonstrated better predictive ability compared to solely tracking changes in the money supply. According to a study conducted by Cecchetti (2000), it was discovered that moderate to low levels of inflation could have a negative impact on real economic growth.

On the other hand, some studies have found a link between inflation and a decline in economic growth. In a study conducted by Thirlwall and Barton (1971), they examined the relationship between inflation and economic growth in different countries. Their findings revealed a positive correlation between inflation and economic growth in industrialized nations, while a negative correlation was observed in emerging economies. According to Fischer (1993), inflation has a negative impact on economic growth as it hampers investment and productivity. In 2001, a study was conducted by Malik and Chowdhury to explore the correlation among South Asian nations. It was found that there is a positive correlation between inflation and economic growth. Fluctuations in growth rates have a stronger impact on inflation compared to how fluctuations in inflation rates affect growth. In a study conducted by Khan and Senhadji (2001), crime statistics from 140 developing and industrialized nations were analyzed, spanning the years 1960 to 1998. According to their analysis, there is a point at which inflation can start to harm economic growth. Threshold values in industrialized countries typically range from 1 to 3 percent, while undeveloped countries often have larger threshold values, ranging from 7 to 11 percent.

Pakistan has a wide range of empirical studies on the connections between inflation, monetary policy, and economic growth, in addition to its collection of international literature. In 1982, Afridi and Qadir conducted a study on inflation in two industries in Pakistan, using them as an example. According to their findings, the inflation rate in the consumer sector was approximately three times higher than in the producing sector. Naqvi and Khan (1989) conducted a thorough analysis of the factors influencing inflation and quantified the specific impact of these variables. In their study, Ahmad and Harim (1991) utilized the Ordinary Least Squares (OLS) method to examine the relationship between inflation and monetary policy. Various factors were discovered to have an impact on inflation, including the rise in real GDP, the increase in import unit value, the growth of nominal money, and the occurrence of delayed inflation. In 1994, Abbas and Mahmood conducted a thorough analysis of the financial consequences of monetary policy. In a study conducted by Chaudhary and Ahmad (1995), it was found that relying on the banking sector to fund the domestic budget deficit had long-term inflationary consequences. In 2002, Qayyum computed Pakistan's monetary conditions index (MCI) for the inflation variable. He mentioned that Pakistan did not have previous evaluations of a comprehensive metric that indicated the position of monetary policy.

In addition, Qayyum and Bilqees (2005) computed Pakistan's primary inflation indicator utilizing the p-star model. Based on their statement, Pakistan did not have any previous evaluations of a comprehensive measure that indicates the position of monetary policy. A study conducted by Khan and Schimmelpfennig (2006) revealed the significant impact of monetary forces on inflation in Pakistan. The rise in inflation can be attributed to the growth of broad money and the increase in private sector credit, which occurred with a lag of 12 months. According to Qayyum (2006), it was suggested that inflation in Pakistan is primarily influenced by monetary factors. In a study conducted by Munir and Mansur (2009), the correlation between the inflation rate and economic development in Malaysia from 1970 to 2005 was investigated. A fascinating discovery has been made in Malaysia, revealing an intriguing non-linear relationship between inflation rate and economic development. Based on the threshold regression model, it has been found that an inflation rate of 3.89% marks the point at which inflation starts to have a notable impact on GDP growth. In addition, there is a notable correlation between the inflation rate and growth when it drops below a certain threshold level. In a study conducted by Sergii (2009), an analysis was performed to examine the relationship between growth and inflation in Commonwealth of Independent States (CIS) republics during the period of 2001 to 2008. According to the findings, economic growth was hindered when inflation surpassed 8%, but was supported when it remained below this threshold. There is a noticeable non-linear increase in inflation, which remains resistant across different estimation methodologies and specifications. In a study conducted by Espinoza et al. (2010), a comprehensive dataset of 165 nations, including oil-exporting countries and Azerbaijan, was utilized to analyze the impact of inflation on the growth of Gross Domestic Product (GDP). Their transition model from 1960 to 2007 was remarkably smooth, suggesting that a 10% level of inflation was crucial for GDP growth in all groups of nations, except for advanced countries which had a significantly lower threshold. Given the circumstances in oil-exporting countries, it was essential to evaluate how inflation impacts the growth of the non-oil gross domestic product (GDP). When the inflation rate exceeds 13%, it significantly impacts the non-oil GDP, leading to an annual decline of 2.7%. In a study conducted by Ayyoub et al. (2011), the relationship between inflation and economic growth in Pakistan's economy was examined. In addition, they examined the impact of inflation on economic growth. An interesting finding emerged regarding the relationship between inflation and GDP growth. Once a certain threshold is crossed, inflation begins to adversely affect the GDP's economic growth, as determined. According to thorough analysis and statistical evaluations, it is advisable for the central bank of Pakistan to aim for an inflation rate below 7% and ensure its stability. With its potential to make a substantial impact on overall economic growth, this has the capacity to be a valuable asset. It was proposed that Pakistan's central bank should strive to maintain a steady inflation rate below 7% by utilizing descriptive and econometric evaluations. With its potential to enhance economic growth, it can have a significant impact.

The research highlights the crucial role of monetary policy in shaping import, export, and foreign direct investment (FDI). Research indicates that changes in monetary policy can affect the levels of imports and exports. Monetary policy has a significant impact on foreign direct investment (FDI), leading to various outcomes that can be either favorable or unfavorable, depending on specific circumstances. Further research in various settings is crucial to improve understanding and guide policy formulation.

3. Method and Methodology

The study utilizes several econometrics methodologies to achieve its objectives, including the Augmented Dickey Fuller unit root test, Autoregressive distributive Lag Bound cointegration test, Error correction model (ECM), and Granger causality tests. This research encompasses annual data for various variables from 1976 through 2020. These variables include the percentage of GDP represented by exports of goods and services, imports of goods and services, broad money, consumer price index, nominal effective

exchange rate, discount rate, and foreign direct investment inflow. All the variables used in this study are listed in Table 1. The data is sourced from International Financial Statistics (IFS). This research project utilizes the following models.

$$Imort_t = a_0 + \beta_1 DR_t + \beta_2 M2_t + \beta_3 \pi_t + \beta_4 ER_t + e_t$$
$$Export_t = \mu_0 + \mu_1 DR_t + \mu_2 M2_t + \mu_3 \pi_t + \mu_4 ER_t + £_t$$
$$FDI_t = \gamma_0 + \gamma_1 DR_t + \gamma_2 M2_t + \gamma_3 \pi_t + \gamma_4 ER_t + \vartheta_t$$

Where DR, M2, π, ER and FDI shows discount rate, money supply, inflation rate, exchange rate, and foreign direct investment, respectively.

Table 1: Variables of the study

Variables Name	Symbol	Dependent/ Independent	Definition
Export	EXP	Dependent	Exports refer to the tangible and intangible products that are manufactured or provided within a certain nation and subsequently traded to customers located in a different country.
Import	IMP	Dependent	An import refers to the purchase of an item or service in one country that has been manufactured in another country.
Foreign Direct Investment	FDI	Dependent	Foreign direct investment (FDI) refers to the acquisition of an ownership interest in a foreign firm or venture by an investor, company, or government from a different nation.
Discount Rate	DR	Independent	The discount rate refers to the interest rate at which the Federal Reserve lends money to commercial banks and other financial institutions for a short period of time.
Exchange Rate	ER	Independent	An exchange rate refers to the specific rate at which one currency can be exchanged for another currency. This rate has a significant impact on international trade and the flow of funds across different countries.
Inflation Rate	INF	Independent	Inflation refers to the upward movement of prices, resulting in a decrease in the ability to buy goods and services over a period of time.
Money Supply	M2	Independent	It refers to the aggregate value of all currency and other easily convertible assets inside an economy at a specific point in time.

3.1. Dickey Fuller Augmented Test

Given the utilization of time series data in the recent study, it is important to consider the potential for misleading regression results when one time series data is regressed on another. When it comes to incorrect regression analysis, it is possible to obtain a remarkably high R2 value exceeding 0.9, while simultaneously having a significantly low Durbin-Watson statistic. As evidenced by the value of d=0.093, there is a significant correlation between the variables. Although it is important to note that high R2 values and low Durbin-Watson values do not necessarily indicate a definitive relationship between the variables. Time series data typically exhibit a consistent upward trend, as they evolve over time. Consequently, they generate inaccurate regression models or regression models that lack coherence. Non-stationary time series exhibit a lack of constancy in both their mean and variance over time. Predicting future outcomes is extremely challenging given the nature of this time series. It is important to note that the behavior of a single sample of data cannot be applied to other time periods. Consequently, these data sets have limited utility. Stationarity is a property of a variable where its mean and variance remain constant over time. Over time, a time series such as this one tends to return to its average value (Gujarati, Porter, & Gunasekar, 2012). Using the Augmented Dickey-Fuller Test (1979), we were able to assess the presence of unit roots and measure the extent of difference. From a mathematical standpoint, the test for time series Y relies on the ADF regression.

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \sum_{i=1}^{m} \alpha_i \Delta Y_{t-1} + e_t$$

Where e_t denotes a pure white noise error term and ΔY_{t-1} = ($Y_{t-1} - Y_{t-2}$), ΔY_{t-2} = ($Yt-2 - Yt-3$), etc. The quantity of lagged difference terms to include is often determined empirically, with the objective of incorporating enough terms so that the error term in the model is serially uncorrelated, enabling us to get an unbiased estimate of the coefficient of lagged Yt1. The lag time in E-views 9 is automatically selected based on Akaike, Schwarz, and other information criteria. We verify in ADF that = 0 under H0 (unit root).

3.2. Autoregressive and Distributed-Lag Model

Utilizing the distributed lag model, the time series data is analyzed by incorporating lagged values of independent variables alongside current values. Autoregressive models take into account the past values of the dependent variable. The ARDL model incorporates lag values for both the dependent and independent variables. These models have proven to be incredibly valuable in empirical economics as they take into consideration the element of time, effectively converting static economic theory into dynamic economic theory. They analyze the different responses of the dependent variable to a one-unit change in the explanatory variable's value, considering both the short-run and long-run effects. The ARDL model is commonly used to represent all three of the considered models.

$$\ln(\text{Import}_t) = c_0 + \sum_{i=0}^{p1} c_i \ln(DR)_{t-i} + \sum_{j=0}^{p2} d_j \ln(M2)_{t-j} + \sum_{k=0}^{p3} e_k \ln(\pi)_{t-i} + \sum_{l=0}^{p4} f_i \ln(ER)_{t-l} + \sum_{m=1}^{p5} g_i \ln(\text{Import})_{t-l} + u_{1t}$$

$$\ln(\text{Export}_t) = c_0 + \sum_{i=0}^{p1} c_i \ln(DR)_{t-i} + \sum_{j=0}^{p2} d_j \ln(M2)_{t-j} + \sum_{k=0}^{p3} e_k \ln(\pi)_{t-i} + \sum_{l=0}^{p4} f_i \ln(ER)_{t-l} + \sum_{m=1}^{p5} g_i \ln(\text{Export})_{t-l} + u_{2t}$$

$$\ln(\text{FDI}_t) = c_0 + \sum_{i=0}^{p1} c_i \ln(DR)_{t-i} + \sum_{j=0}^{p2} d_j \ln(M2)_{t-j} + \sum_{k=0}^{p3} e_k \ln(\pi)_{t-i} + \sum_{l=0}^{p4} f_i \ln(ER)_{t-l} + \sum_{m=1}^{p5} g_i \ln(\text{FDI})_{t-l} + u_{3t}$$

The number of optimal number of lags are selected using different information criterion to estimate the model.

3.3. ARDL Bound Cointegration Test

Using the Autoregressive Distributive Lag (ARDL) bounds cointegration method developed by Pesaran et al. (2001), we can assess the long-term and short-term dynamics of the factors. According to Inder (1993), this analysis offers significant advantages compared to Johansen cointegration approaches. These involve providing consistent outcomes regardless of the variable order, whether it falls under I(0) or I(1), or when there is mutual integration. This contrasts with the approaches of Granger and Engle and Johansen and Juslius (1990). According to Inder (1993), the ARDL bounds test is capable of effectively addressing the issue of endogeneity and provides unbiased test statistics, even with a small sample size. In addition, the ARDL model is capable of accurately addressing any bias caused by missing lag components. In this work, Equation (1) is transformed into the unconditional error correction model (UECM) as shown below to facilitate the implementation of the ARDL bounds testing method.

$$\triangle\ln(\text{Import}_t) = c_0 + b_1\ln(\text{Import})_{t-1} + b_2\ln(\text{DR})_{t-1} + b_3\ln(\text{M2})_{t-1} + b_4\ln(\pi)_{t-1} + b_5\ln(\text{ER})_{t-1} + \sum_{i=0}^{p1} c_i \triangle\ln(DR)_{t-i} + \sum_{j=0}^{p2} d_j \triangle\ln(\text{M2})_{t-j} + \sum_{k=0}^{p3} e_k \triangle\ln(\pi)_{t-i} + \sum_{l=0}^{p4} f_i \triangle\ln(\text{ER})_{t-l} + \sum_{m=1}^{p5} g_i \triangle\ln(\text{Import})_{t-l} + u_{1t}$$

$$\triangle\ln(\text{Export}_t) = c_0 + \sum_{i=0}^{p1} c_i \triangle\ln(DR)_{t-i} + \sum_{j=0}^{p2} d_j \triangle\ln(\text{M2})_{t-j} + \sum_{k=0}^{p3} e_k \triangle\ln(\pi)_{t-i} + \sum_{l=0}^{p4} f_i \triangle\ln(\text{ER})_{t-l} + \sum_{m=1}^{p5} g_i \triangle\ln(\text{Export})_{t-l} + b_1\ln(\text{Export})_{t-1} + b_2\ln(\text{DR})_{t-1} + b_3\ln(\text{M2})_{t-1} + b_4\ln(\pi)_{t-1} + b_5\ln(\text{ER})_{t-1} + u_{1t}$$

$$\triangle\ln(FDI_t) = c_0 + \sum_{i=0}^{p1} c_i \triangle\ln(DR)_{t-i} + \sum_{j=0}^{p2} d_j \triangle\ln(\text{M2})_{t-j} + \sum_{k=0}^{p3} e_k \triangle\ln(\pi)_{t-i} + \sum_{l=0}^{p4} f_i \triangle\ln(\text{ER})_{t-l} + \sum_{m=1}^{p5} g_i \triangle\ln(\text{FDI})_{t-l} + b_1\ln(\text{FDI})_{t-1} + b_2\ln(\text{DR})_{t-1} + b_3\ln(\text{M2})_{t-1} + b_4\ln(\pi)_{t-1} + b_5\ln(\text{ER})_{t-1} + u_{1t}$$

The ARDL bound test technique consists of two phases. An F-test is employed to ascertain the collective significance of the lags level factors. The next step involves estimating both long-term and short-term variables in order to utilize the error correction model (ECM). In order for the dynamics to transition to the long-run equilibrium, it is crucial that the coefficient's sign for the lagged error correction component (ECMt-1) is both statistically significant and negative. The diagnostic procedures involve conducting tests to assess serial correlation, functional form, normalcy, and multi-collinearity. Once the factors for the long-run relationship have been co-integrated, it becomes possible to examine both short-term and long-term causation. The research study employs a range of models and tests to examine the connections between the variables of interest, guaranteeing the dependability and precision of the findings.

4. Results and Discussions

This section provides the results of the analysis while keeping in view the objective, the research questions and the hypothesis of the present study. In this section, descriptive statistics provides an overview of the basic statistics for each variable. In addition, it also presents the correlation matrix and the relationship among various variables. Furthermore, the section fixes the order of integration by conducting an ADF unit root test to investigate unit roots. Likewise, the Bond cointegration test was used to analyze the long-term connection between variables.

Table 2: Descriptive Statistics Analysis of the variables

	DR	ER	EXP	FDI	IMP	INF	M2
Mean	10.926	235.224	13.133	0.894	19.001	8.103	46.412
Median	10.000	172.296	13.336	0.672	19.422	7.844	45.410
Maximum	20.000	617.312	17.270	3.668	23.211	20.286	58.867
Minimum	6.250	59.837	8.221	0.102	13.243	2.529	34.799
Std. Dev.	3.138	162.523	2.524	0.779	2.580	3.720	5.9165
Skewness	1.016	0.955	-0.263	2.304	-0.641	0.722	0.070
Kurtosis	3.754	2.804	2.233	7.902	2.846	3.962	2.076
Jarque-Bera	8.034	6.307	1.476	77.35	2.855	5.144	1.490
Probability	0.018	0.042	0.477	0.000	0.239	0.076	0.474
Observations	41	41	41	41	41	41	41

The descriptive statistics analysis of all variables is presented in Table 2. According to the data in Table 1, the DR has an average value of 10.92683, with a maximum value of 20 and a minimum value of 6.25. In addition, a value of 3.75 is obtained for the kurtosis. The Jarque-Bera test indicates that the discount rate does not conform to a normal distribution, as evidenced by a p-value of 0.018. It becomes clear when the null hypothesis of normal data is rejected at this p-value. The ER has a mean value of 235.22, with a minimum of 59.83 and a maximum of 617.31. Based on the p-value of 0.42, it can be inferred that the data conforms to a normal distribution with a significance level of 5%. The average export value stands at 13.13, with a minimum recorded at 8.22 and a maximum reaching 17.27. The p-value is 0.477. Based on the results of the Jarque-Bera test, it seems that the data follows a normal distribution. FDI has a mean value of 0.89. 0.10 is the minimum value and 3.66 is the maximum value. In addition, a p-value of 0.0000 from the Jarque-Bera test suggests that the data does not conform to a normal distribution. The import value averages at 19.00, reaching a maximum of 23.21 and a minimum of 13.24. In addition, a p-value of 0.23 was obtained. According to the Jarque-Bera test, the data does not exhibit a normal distribution. On average, the inflation rate stands at 8.10, reaching a maximum of 20.28 and a minimum of 2.52. Based on the p-value of 0.07 from the Jarque-Bera test, it can be concluded that the data does not conform to a normal distribution. The money supply has a mean value of 46.41, with a minimum value of 34.7 and a maximum value of 58.86. Based on the Jarque-Bera test, it can be inferred that the data is consistent with a normal distribution, as indicated by the p-value of 0.47.

Table 3: Correlation Analysis of the variables

Correlation	DR	ER	EXP	FDI	IMP	INF	M2
DR	1.000						
ER	0.006	1.000					
EXP	0.461	0.164	1.000				
FDI	0.200	-0.365	0.166	1.000			
IMP	0.304	0.477	0.062	0.149	1.000		
INF	0.531	-0.090	0.274	0.393	0.503	1.000	
M2	-0.002	-0.660	-0.326	0.555	0.144	0.247	1.000

The correlation analysis of all the variables being considered is presented in Table 3. There is a weak positive correlation between the discount rate and FDI, but the correlation with ER M2 is nearly nonexistent. Similarly, EXP, IMP, and INF show a positive and moderate correlation with the discount rate. In a similar vein, EXP shows a positive week correlation with ER, while INF shows a negative week correlation with ER. ER and FDI have a negative moderate correlation, while ER and IMP have a moderate positive correlation. ER and M2 have a strong negative correlation and FDI and IMP have a strong positive correlation. INF has a moderate positive correlation, while M2 has a moderate negative correlation. IMP shows a strong positive correlation with FDI, while INF has a moderate positive correlation. Similarly, a strong and positive correlation exists between FDI and M2. There is a moderate positive correlation between IMP and INF, and a weak positive correlation between IMP and M2. INF and M2 have a strong positive correlation. EXP, FDI, IMP, and INF show a clear positive correlation. IMP and M2 have a moderate negative correlation. FDI has a positive correlation with IMP, INF, and M2. IMP, INF, and M2 are positively correlated. INF and M2 have a positive correlation.

Table 4: Unit Root Results at Level

Variables	None		C		C+T	
	At Level	Conclusion	At Level	Conclusion	At Level	Conclusion
DR	-0.211	Unit Root	-2.499	Unit Root	-2.528	Unit Root
ER	-4.020	Stationary	-0.821	Unit Root	-2.835	Unit Root
EXP	-0.616	Unit Root	-0.991	Unit Root	-1.617	Unit Root
IMP	-0.507	Unit Root	-2.616	Unit Root	-2.627	Unit Root
INF	-0.708	Unit Root	-2.763	Unit Root	-2.721	Unit Root
FDI	-2.060	Stationary	2.166	Unit Root	-2.069	Unit Root
M2	0.447	Unit Root	-1.803	Unit Root	-3.478	Unit Root

Table 4 displays the outcome of the Augmented Dickey Fuller (ADF) test for all the variables under consideration, at the level. It has been noted that ER and FDI exhibit stationarity when the ADF equation does not include a constant or trend, while all other

variables (INF, M2, DR, IMP, and EXP) have a unit root. However, all variables were found to have unit root at a 5% level of significance when analyzed over a constant and trending period.

Table 5: Unit Root Results at 1st Difference

Variables	None		C		C+T	
	At 1st Diff	Conclusion	At 1st Diff	Conclusion	At 1st Diff	Conclusion
DR	-6.193	Stationary	-6.109	Stationary	-5.350	Stationary
ER	-3.101	Stationary	-5.306	Stationary	-7.978	Stationary
EXP	-6.308	Stationary	-6.279	Stationary	-6.380	Stationary
IMP	-6.939	Stationary	-6.870	Stationary	-6.801	Stationary
INF	-6.896	Stationary	-6.805	Stationary	-6.694	Stationary
FDI	-5.891	Stationary	-5.816	Stationary	-5.767	Stationary
M2	-5.759	Stationary	-5.741	Stationary	-5.654	Stationary

The results of the Augmented Dickey Fuller (ADF) test for each of the factors examined (DR, ER, EXP, IMP, INF, FDI, M2) are presented in Table 5. Upon analyzing the 1s difference, it is evident that all variables have achieved stationarity. At a significance level of 5%, all variables were found to be stationary, both with and without a trend.

Table 6: Bound test Results for Import Model

Test Statistic	Value	K
F-statistic	6.271	4
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.45	3.52
5%	2.86	**4.01**
2.5%	3.25	4.49
1%	3.74	5.06

The findings of the bound ARDL co-integration test can be found in Table 6. Panel A shows the F-statistics value for the Bound co-integration test for a variable number (4). Panel B presents the necessary values for the F-test statistics. 10 Bounds indicate the lower critical values and 11 Bounds indicate the higher critical values. Researchers reject or accept the null hypothesis at different degrees of importance according to the key parameters which play an important part in this determination. The null hypothesis is dismissed when the F-test statistic surpasses the greater critical value. The null hypothesis is not rejected if the F-test statistic is less than the lower threshold. The F-test falling between the lower and higher critical levels renders the result inconclusive, preventing us from rendering an authoritative choice as to whether to dismiss or not to dismiss the null hypothesis as valid. We use a significance threshold of 5% in this study. The table shows that the F-test value exceeds the upper bound (11) at the 5% level of significance, which leads to the rejection of the null hypothesis. Thus, we may conclude that each variable possesses long-term interdependence. You can find the findings of the short-term estimations in Table 7. We have considered a range of variables, including the discount rate, exchange rate, money supply, and inflation. Out of all these variables, it is worth noting that the discount rate and inflation have a significant positive impact, yet their statistical importance has not been established. In addition, it's important to mention that the short-term performance of the IMP is greatly influenced by the rate of exchange and money supply. Based on economic analysis, it

is found that approximately 85% of the difference gets resolved on a yearly basis, which facilitates the transition from the short-term to the long-term balance. In addition, statistical significance is attributed to this term.

Table 7: Short Run Estimation of Import Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LDR)	0.101		1.408	0.170
D(LER)	0.232	0.062	3.718	0.001
D(LINF)	0.073	0.038	1.891	0.069
D(LM2)	0.912	0.200	4.559	0.000
D(LM2(-1))	-0.511	0.239	-2.138	0.042
D(LM2(-2))	0.018	0.242	0.076	0.939
D(LM2(-3))	-0.336	0.181	-1.852	0.075
ECM(-1)	-0.852	0.167	-5.101	0.000
Cointeq = LIMP - (-0.12*LDR + 0.28*LER + 0.16*LINF + 1.40*LM2-3.9064)				

Table 8: Long Run Estimation of Import Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LDR	-0.121	0.072	-1.682	0.104
LER	0.272	0.043	6.277	0.000
LINF	0.162	0.041	3.930	0.000
LM2	1.408	0.265	5.298	0.000
C	-3.906	1.201	-3.252	0.003

Table 8 contains the long-run estimates for the import model. After analyzing the variables, it becomes clear that the discount rate has a noticeable negative effect on IMP, although it falls short of reaching statistical significance. It is important to highlight that the currency exchange rate, inflation, and money supply have a significant and positive impact on IMP in the long run. These findings align with the established body of research on the topic. You can find the findings of the Bound cointegration test for the export model in Table 8. It is worth mentioning that the F-test value of 4.51 exceeds the critical value of 4.01, suggesting a substantial and enduring relationship among EXP, DR, ER, INF, and M2.

Table 9: Bound Test Results of Export Model

Test Statistic	Value	K
F-statistic	4.511	4
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

Cointeq = LEXP - (0.2712*LDR + 0.1467*LER + 0.3413*LINF -1.3258*LM2 + 5.2208)

Table 10 presents the estimations for the short-run. Some factors can either boost or hinder exports in the short term. Observing the effects, whether they are positive or negative, can be done by analyzing both past and present values. Based on the ECM term of -0.26, it indicates that approximately 26% of the adjustment towards long-run equilibrium occurs on an annual basis. This highlights the gradual shift from the short term to the long term.

Long-term estimates of the export model are shown in Table 11, which may be accessed here. When all of the factors that were investigated are taken into consideration, it becomes manifest that the money supply has a considerable and detrimental effect on EXP. Along the same lines, the exchange rate, inflation, and discount rate all have a large impact on EXP over the course of a long period of time, and this impact is statistically significant. These findings are consistent with the research that has been done previously on the topic.

Table 10: Short Run Estimates of Export Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LEXP(-1))	0.001	0.160	0.010	0.991
D(LEXP(-2))	-0.388	0.136	-2.837	0.011
D(LDR)	0.056	0.071	0.792	0.439
D(LDR(-1))	0.100	0.095	1.047	0.310
D(LDR(-2))	-0.049	0.090	-0.542	0.594
D(LDR(-3))	-0.144	0.103	-1.386	0.184
D(LER)	-0.677	0.261	-2.594	0.019
D(LER(-1))	1.052	0.411	2.559	0.021
D(LER(-2))	-0.914	0.256	-3.565	0.002
D(LINF)	0.018	0.043	0.426	0.675
D(LINF(-1))	0.034	0.043	0.793	0.439
D(LINF(-2))	-0.073	0.042	-1.716	0.105
D(LINF(-3))	0.070	0.037	1.863	0.080
D(LM2)	0.317	0.203	1.560	0.138
D(LM2(-1))	0.337	0.231	1.456	0.164
CointEq(-1)	-0.260	0.120	-2.160	0.046

Table 11: Long Run Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LDR	0.271	0.098	2.756	0.040
LER	0.146	0.012	11.705	0.000
LINF	0.341	0.086	3.925	0.000
LM2	-1.325	0.110	-11.956	0.000
C	5.220	4.536	1.150	0.266

Table 12: Bound Test Results of FDI Model

Test Statistic	Value	K
F-statistic	6.573	4
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.45	3.52
5%	2.86	**4.01**
2.5%	3.25	4.49
1%	3.74	5.06

Table 13: Short Run Estimates of FDI Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LFDI(-1))	0.156	0.159	0.980	0.340
D(LFDI(-2))	-0.293	0.142	-2.055	0.055
D(LFDI(-3))	0.424	0.175	2.423	0.026
D(LDR)	0.673	0.334	2.015	0.059
D(LDR(-1))	0.412	0.385	1.068	0.300
D(LER)	1.223	1.154	1.059	0.304
D(LER(-1))	0.884	1.819	0.485	0.633
D(LER(-2))	0.856	1.592	0.537	0.597
D(LER(-3))	-1.216	1.008	-1.206	0.244
D(LINF)	0.088	0.219	0.403	0.691
D(LINF(-1))	-0.331	0.228	-1.448	0.165
D(LM2)	3.714	0.912	4.070	0.000
D(LM2(-1))	-1.265	1.117	-1.132	0.273
D(LM2(-2))	-0.268	1.061	-0.252	0.803
D(LM2(-3))	2.205	0.738	2.987	0.008
CointEq(-1)	-0.421	0.119	-3.519	0.002

The data shown in Table 11 suggest that there is a connection between foreign direct investment (FDI) and all of the other factors over an extended period of time. It is possible to draw the conclusion that there is cointegration among foreign direct investment (FDI) and the other variables on the basis of the finding that the estimated result of the F-test is greater than the upper bound critical value.

Table 14: Long Run Estimates of FDI Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LDR	0.617	0.842	0.732	0.473
LER	-0.608	0.398	-1.525	0.145
LINF	-0.259	0.484	-0.536	0.598
LM2	-2.876	2.599	-1.106	0.283
C	12.959	12.208	1.061	0.303

The long-term estimates of foreign direct investment (FDI) are displayed in Table 14. When it comes to the variables we looked at, it turns out that the discount rate has a notable impact on FDI, but unfortunately, this impact is not statistically significant. In the same vein, the exchange rate, inflation, and money supply do not seem to have a significant long-term effect on FDI. These findings are consistent with the existing literature on the subject.

5. Conclusions

As demonstrated by the Jarque-Bera test, the discount rate (DR), exchange rate (ER), and inflation (INF) all exhibit non-normal distributions. This is in accordance with the descriptive statistics. In the course of the correlation study, the various degrees of correlation among the variables are uncovered. These levels of correlation might range from weak to moderate to significant positive or negative correlations. According to the results of the unit root tests, it would appear that the bulk of the variables are not static at the level; yet, those variables remain static after first differences are taken into account. It seems that there are links between the variables that are long-term in nature. The findings of the bound test also indicate that there exists an extended connection between imports (IMP) and the other variables which were investigated. This is shown by the fact that the bound test was successful. As we investigate the short-run estimation, we discover that the money supply (LM2) and the exchange rate (LER) are two factors that have a significant influence on the amount of goods that are imported. On the other hand, the long-run estimation (Table 8) places an emphasis on the positive and statistically significant impacts that the exchange rate, inflation, and money supply have on imports. The findings of the bound test reveal that there is a substantial and lasting connection among exports, discount rate, currency exchange rate, inflation, and money supply. This is similar to what an economist would say. A good insight into the coefficients of the cointegrating form is provided by the short-run estimates, which are presented in Table 10. These estimates reveal the influence that previous values have on exports. Within a short period of time, the coefficient values illustrate the influence that various variables have on the export variable, which is denoted by the symbol. The findings indicate that previous export values and money supply have a positive impact on export, despite the fact that the statistical significance of these factors has not been established. In addition, the discount rate (LDR) and the exchange rate (LER) both have a negative impact on exports, despite the fact that their influence is not statistically significant. The inflation rate (LINF) has a considerable and beneficial impact on exports, with statistical significance at the 5% level, according to economic study. This impact is positive and significant. It is possible to determine the long-term effects of the variables on export by examining the coefficient values. There is still a negative impact on exports brought about by the discount rate (LDR), despite the fact that it does not demonstrate statistical significance. Exports, on the other hand, are positively influenced by the exchange rate (LER), the inflation rate (LINF), and the money supply (LM2), all of which have a statistically significant impact. The conclusions of this study are in line with those of previous research on the subject.

The findings provide helpful data on both the short- and long-term effects of various factors on imports and exports, as well as indicating the existence of long-term links between the variables in question. Noting that factors such as the currency rate, inflation rate, and money supply all have substantial effects on export and import is something that should be taken into consideration while discussing the impact on these two areas. On the other hand, it does not appear that the discount rate and the lagged export values have particularly significant effects. Our understanding of global trade patterns is improved as a result of these discoveries, which also provide significant information for policymakers and industry experts who are active in trade management. This research contributes to a better understanding of the dynamics of fiscal policy and international trade, providing policymakers and practitioners with useful insights that can be utilized in the effective management of trade partnerships within the context of Pakistan.

6. Policy Recommendations

According to the findings, we can make the following policy recommendations. It is important for policymakers to address the non-normal distributions of variables like discount rate, exchange rate, and inflation. Measures should be taken to promote stability and reduce volatility in these areas. This may involve implementing monetary policies that aim to stabilize exchange rates and control inflation, as well as enacting regulatory measures to effectively manage interest rates. Furthermore, the different levels of correlation among the variables highlight the interdependence of the factors that impact imports and exports. It is crucial for policymakers to carefully analyze these correlations and incorporate policies that acknowledge the interconnectedness of various economic factors. When it comes to policies aimed at promoting exports, it's important to take into account the impact of factors like exchange rates and money supply. Furthermore, the occurrence of long-term connections among the variables indicates the how significant importance is the ongoing efforts in trade relationship management. Policymakers should prioritize the implementation of policies that promote sustainable and robust growth in international trade. This could include establishing a favorable climate for investment, maintaining stable prices, and implementing strategies to enhance the overall competitiveness of the export industry. The effect of rate of exchange, rate of inflation and money supply on imports and exports highlights the crucial role these factors play in shaping trade dynamics. It is important for policymakers to take into account the implementation of policies that encourage stability in exchange rates, manage inflationary pressures, and maintain a sufficient money supply to facilitate trade activities. This may require

the implementation of exchange rate management mechanisms, the pursuit of prudent monetary policies, and the creation of a favorable environment for foreign direct investment. This study highlights the significance of consistently monitoring and evaluating trade dynamics and the factors that drive them. It is important for policymakers to regularly evaluate the impact of implemented policies and make any necessary changes in response to evolving circumstances.

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