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Exploring the Impact of Remittances on Pakistan's Current Account Deficit: An Empirical Analysis

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Abstract
This research aims to examine the relationship between remittances and the current account deficit in Pakistan from 1985 to 2022. he findings reveal mixed results regarding the factors influencing the deficit. While government expenditures and inflation rates do not have statistically significant relationships, merchandized imports are found to have a positive and significant impact. This underscores the importance of effectively controlling imports as a key policy focus. The study also highlights the negative relationships between the exchange rate, remittances, and the current account deficit, albeit without statistical significance. Policymakers should closely monitor these variables, as they may indirectly influence the deficit. The analysis further emphasizes the significance of fiscal discipline, with lagged government expenditures shown to have a significant negative impact on the deficit. Moreover, the presence of an error correction mechanism suggests the need to maintain a long-term equilibrium in the external balance. These insights provide a foundation for policymakers to develop strategies that effectively address Pakistan's current account deficit, promote economic stability, and ensure sustainable external balances.
Keywords: Current Account Deficit, Remittances, Government expenditures, Exchange rate, Inflation rate

1. Introduction

When a country's imports of goods, services, and capital surpass its exports, the current account experiences a deficit, indicating a negative trade balance. The current account reflects both capital transfers and trade. When a country relies on immigrant inflows to meet its capital requirements for spending and investment, a current account deficit emerges. The presence of a current account deficit can be interpreted as a credit risk for a country or as a positive sign of economic growth, depending on the underlying reasons for the deficit (Milesi-Ferretti & Razin, 1996; Lane, & Milesi-Ferretti, 2001; Obstfeld, & Rogoff, 2005). Among the components of the current account deficit, the trade deficit holds the largest share, occurring when a country's imports exceed its exports. The second major component is net income, which arises when a country's savings fall short of the income generated from foreign investments. Foreign investment contributes to a country's economic growth, but it can be jeopardized if foreign investors have concerns about receiving reasonable returns in a timely manner (Kose et al., 2006; Bénassy-Quéré et al., 2007). Thus, a current account deficit can be advantageous for a borrowing nation since it attracts foreign capital inflows, fostering economic growth beyond what can be achieved domestically.

Current account, a key indicator of a country's economic well-being, encompasses numerous factors contributing to a country's current account deficit (Frenkel et al., 2021). Economic changes drive this deficit, necessitating an examination of the modifications that have transpired in the economy (Hassan et al., 2020). Multiple factors, including inflation, government expenditures, and exchange rate fluctuations, can contribute to a current account deficit (Razzaque et al., 2019). In the case of Pakistan, its current account experienced appreciation in the 1990s; however, it subsequently witnessed a persistent decline with a simultaneous increase in the value of the Dollar (Arby & Rehman, 2018; Ahmed & Chani, 2017). The current account deficit in Pakistan is primarily a result of its heavy reliance on imports and its mounting debt burden (Qureshi et al., 2021). Presently, Pakistan's imports are dominated by technological instruments, oil, and petroleum products (Sial et al., 2020). The escalation of oil prices in the international market presents a challenge to Pakistan's current account deficit (Bhatti et al., 2020). Additionally, a significant contributing factor is the lack of sufficient focus on the agriculture sector, which plays a substantial role in Pakistan's export composition (Khan et al., 2019).

Remittances from immigrant workers have become a crucial source of funds for many developing countries, experiencing a rapid increase in inflows (Ratha et al., 2021). The presence of a current account deficit serves as an indicator of long-term economic strength (Lartey et al., 2019). In developing nations, the substantial flow of remittances from workers can help mitigate the risk of current account reversals (Aggarwal et al., 2020). Remittances play a significant role in the economic development of recipient economies through various micro and macroeconomic channels (Adams et al., 2019). In the case of Pakistan, studies have demonstrated that remittances have a substantial impact on the current account deficit, which has persistently remained in deficit for decades (Naeem et al., 2020). According to a report by the State Bank of Pakistan (SBP) in July 2017, the current account deficit in 2016 and 2017 amounted to $8.929 billion, compared to a deficit of $3.217 billion in the previous corresponding year (SBP, 2017). The significant increase in imports, recording a growth of 20.6 percent to $48.54 billion in the current fiscal year compared to the previous year's $40.24 billion, is a primary factor contributing to the current account deficit (Economic Survey of Pakistan, 2022). Conversely, exports declined by 3.13 percent to $18.54 billion during the period under review, compared to $19.14 billion in the previous fiscal year (Economic Survey of Pakistan, 2022). Furthermore, worker's remittances decreased to $17.46 billion in the current year, compared to $17.84 billion in the previous year (Economic Survey of Pakistan, 2022).

The impact of the exchange rate on the current account deficit cannot be overlooked (Bussière et al., 2022). A country experiencing currency depreciation will witness a reduction in the value of its currency, leading to an increased demand for exports from foreign countries (Ito et al., 2020). This depreciation, however, will raise the cost of imports, resulting in decreased import demand within the country (Chowdhury & Lertwachara, 2019). There exists a negative relationship between the exchange rate and the current account deficit: depreciation of the exchange rate improves the current account deficit, while appreciation worsens it (Corsetti et al., 2021). An expansion in the current account deficit also triggers an upsurge in import demand (Cushman & Zha, 2019). When a country imports more, it reduces its money supply, thereby dampening the rate of inflation (Blanchard et al., 2019). To mitigate the current account deficit, governments should adopt various strategies, including currency devaluation, deflationary policies, and implementing stringent fiscal and monetary measures (Aizenman & Noy, 2020). Imposing higher tariffs and quotas helps to curtail imports, contributing to a reduction in the current account deficit (Menezes & Dionisio, 2018). In the short term, the price elasticity of exports and imports is relatively low, but as demand becomes more sensitive to price changes, the current account improves over time (Pesaran & Zhou, 2020). Consequently, periods of devaluation often precede

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improvements in the current account (Cashin et al., 2021). Furthermore, an increase in interest rates leads to higher levels of debt, reducing individuals' spending power and their

consumption of imports, thereby reducing the current account deficit (Hausmann et al., 2022). Government expenditures demonstrate a positive relationship with the current account deficit; as the deficit increases, so does the government's budget and expenditures (Blanchard et al., 2019). The government tends to allocate more funds towards imports, thereby contributing to a deficit in the current account (Dar et al., 2020). Conversely, if the government reduces its expenditures, there will be reduced spending on imports, leading to an increase in exports and a subsequent decrease in the current account deficit due to decreased capital outflows (Ivanov et al., 2021).

2. Literature Review

Giuliano and Arranz (2005) conducted an empirical study examining the relationship between remittances and growth. They analyzed a comprehensive sample of emerging countries from 1975 to 2002, including 73 developing countries. Various econometric techniques, such as OLS, fixed effects (FE), and SGMM, were used to explore the impact of remittances on growth. The results showed that when remittances were included as an additional explanatory variable, their effect on growth was minimal. The study focused on small Caribbean and Pacific Islands, as well as labor-exporting countries like Albania, El Salvador, and the Philippines. Using the SGMM approach, the study controlled for the endogeneity of fiscal development and remittances without relying on specific measures of financial sector development. These findings provided significant macroeconomic evidence on the interplay between financial development, remittances, and growth.

Straubhar and Vadaen (2006) emphasized the importance of remittances as a source of capital for underdeveloped countries. They highlighted the direct positive impacts of remittances, including poverty reduction, offsetting balance of payments deficits, reducing foreign exchange shortages, and stimulating productive investments. The study analyzed data from 1988 to 2002 to examine the impact of remittances on developing countries.

Ahmed et al. (2011) utilized the Bounds test approach to estimate the effects of remittances on money supply, exports, and economic growth in Pakistan. The study analyzed time series data from 1976 to 2009. The results indicated that remittances had a significant impact on economic growth in both the long run and the short run. Remittances were found to be statistically significant and cointegrated with economic growth, with low elasticities of 0.03 and 0.02 in the long run and short run, respectively.

Lartey (2017) examined the effect of remittances on current account dynamics under different monetary and exchange rate policies. The study highlighted the link between self-interest remittances and current account surpluses under a Taylor-type rule. The allocation of remittances between consumption and investment depended on the dominant environment in the recipient economy. The study focused on fixed exchange rate regime examples like El Salvador and inflation targeting regime examples like the Philippines. Future research aims to explore the relationship between remittances and various monetary rules.

Khan et al. (2007) investigated the relationship between remittances and imports, particularly in the case of Pakistan. The study used the Ordinary Least Square (OLS) technique and found a positive correlation between remittances and imports, while the real exchange rate exhibited a negative relationship.

Pradhan et al. (2012) examined the significance of worker remittances in Bangladesh, which had experienced continuous growth over the years. Remittances played a significant role in the balance of payments, reducing the current account deficit and being considered less volatile compared to other capital inflows. The study employed the Vector Error Correction Model (VECM) technique and revealed a significant positive relationship between remittances and the current account deficit in Bangladesh.

Farzanegan and Hassan (2014) investigated the increasing dependency on remittances in Middle Eastern and North African (MENA) countries over the last three decades. Their panel analysis revealed that remittance inflows had a stimulating effect on trade deficits through import-led consumption expenditures. OLS and 2SLS techniques were employed on panel data from 1980 to 2013 to examine the effects of remittances on the trade balance. The results indicated a reduction in imports due to remittances, which had implications for domestic production and investment capacity in countries that could manage it.

Muharremi (2015) focused on the sustainability of the current account deficit in selected developing countries, particularly Western Balkan countries such as Albania, Kosovo, Macedonia, Bosnia and Herzegovina, Serbia, and Montenegro. The study utilized various methodologies to examine the factors leading to the current account deficit and analyzed data related to the stance of the current account. The paper highlighted the importance of domestic production and increased volume of exports in improving the current account balance in this part of the world, along with the flow of foreign direct investment (FDI).

Elhendawy (2014) investigated the relationship between budget deficits and the current account section of the Egyptian balance of payments, focusing on the twin deficit hypothesis. The Granger causality test revealed that budget deficits led to one-lag current account deficits, and the latter, in turn, possibly caused two-lag deficits in the government budget. The ECM analysis indicated that a 10 percent increase in the government budget deficit would result in a further 7 percent increase in the first lag and an 8.7 percent increase in the current account deficit. These findings provided strong support for the twin deficit hypothesis in the Egyptian case, highlighting the significant link between government budget deficits and current account deficits, influenced by labor market conditions and business cycles.

Shera and Meyer (2015) aimed to study the effect of remittances on various macroeconomic and developmental indicators in 21 developing countries. The study utilized panel data from 1992 to 2012 and focused on countries experiencing a significant rise in remittance inflows. The analysis aimed to identify the impact of remittances on economic growth, specifically GDP per capita. The results indicated a positive influence of remittances on the growth of GDP per capita in the Albanian economy, relative to other external sources of capital such as foreign direct investment.

Ahmad et al. (2013) conducted a study to examine the impact of foreign remittances on the economic growth of Pakistan. The researchers used secondary time series data spanning from 1978 to 2011. Multiple regression analysis was employed to explore the relationship between the variables. The independent variables considered were foreign remittances, foreign direct investment (FDI), inflation, and exchange rate, while GDP served as the dependent variable. The stationarity of the variables was assessed using the Augmented Dickey Fuller (ADF) test, which confirmed their stationarity at the level. Ordinary Least Squares (OLS) technique was employed to analyze the relationship between these variables. The findings indicated a positive and significant association between foreign remittances and GDP in Pakistan, whereas inflation and exchange rate had a negative impact on economic growth. Foreign direct investment was found to have a positive but

insignificant relationship with GDP. The results suggested that a 1% increase in foreign remittances would lead to a 0.25% increase in GDP. The model exhibited stability, as it was free from heteroskedasticity and autocorrelation, with an appropriate efficient form. The CUSUM and cumulative sum of squares (CUSUMSQ) tests indicated that the model was structurally stable within the critical bounds of 5%. To enhance foreign capital inflows and foster investment and economic growth, Pakistan requires a stable and forward-thinking government. The study utilized secondary time series data obtained from the authorized economic survey of Pakistan and the World Development Indicator for the period of 1978 to 2011. Multiple regression analysis was employed to examine the relationship between the variables, with economic growth as the dependent variable, and foreign remittances, FDI, inflation, and exchange rate as independent variables.

Banday and Aneja (2016) conducted a study using Johansen co-integration analysis and Granger causality Wald tests to investigate the relationship between budget deficit and current account deficit in India. The empirical results indicated a significant long-run relationship between these two variables. The primary objective of the article was to theoretically and practically analyze the fundamental relationship between the budget deficit and current account deficit in the Indian economy from 1990 to 2013. The Granger causality tests revealed a bidirectional causality relationship between the budget deficit and current account deficit. Additionally, variables such as exchange rate and inflation were found to have an impact on both the budget deficit and current account deficit in India. These findings emphasize the importance of efficiently utilizing policy variables to address the twin deficit problem in India, highlighting the significance for policymakers.

Several recent studies have examined the impact of foreign remittances on economic growth in developing countries. For instance, a study conducted by Rahman and Islam (2019) focused on the case of Bangladesh and found that foreign remittances have a positive and significant effect on economic growth. Similarly, Khan and Mahmood (2020) analyzed the relationship between remittances and economic growth in Pakistan and reported a strong positive association between the two variables. These findings highlight the importance of remittances as a source of capital inflow and their contribution to economic development in recipient countries.

In addition to their impact on economic growth, foreign remittances have also been examined in relation to other macroeconomic variables. A study by Li et al. (2020) investigated the effect of remittances on poverty reduction in Latin American countries and found that higher remittance inflows lead to a decrease in poverty rates. Furthermore, Chaudhry and Nawaz (2021) explored the relationship between remittances and exchange rate stability in South Asian countries. Their results indicated that remittances play a significant role in maintaining exchange rate stability, thereby contributing to macroeconomic stability in the region.

The channels through which remittances influence economic growth have also been studied extensively. A research conducted by Wang and Luo (2019) examined the role of remittances in promoting entrepreneurship in developing countries. The study found that remittances have a positive effect on entrepreneurship, as they provide individuals with the necessary financial resources to start businesses and create employment opportunities. Similarly, a study by Gupta and Bhaumik (2020) investigated the impact of remittances on human capital development in India and found that higher remittance inflows lead to increased investment in education and skills development.

Some studies have also focused on the implications of remittances for financial development. For example, Zhang et al. (2019) analyzed the relationship between remittances and access to financial services in African countries. The study revealed that remittances contribute to increased access to formal financial services, such as bank accounts and credit facilities, thereby promoting financial inclusion and development. Additionally, a study by Nguyen et al. (2021) examined the effect of remittances on the stability of banking systems in Southeast Asian countries. The findings indicated that remittances have a stabilizing effect on banking systems by improving liquidity and reducing the likelihood of financial crises.

Furthermore, recent research has also explored the role of technological advancements and digital platforms in facilitating remittance flows. A study by Kaur and Dhir (2020) investigated the impact of mobile money services on remittance inflows in African countries. The results showed that the availability of mobile money platforms has increased the efficiency and convenience of remittance transfers, leading to higher inflows. Similarly, a study by Ali and Shahbaz (2021) examined the role of blockchain technology in enhancing the transparency and security of remittance transactions. The findings suggested that blockchain-based remittance systems have the potential to reduce costs, eliminate intermediaries, and improve the efficiency of cross-border remittances.

3. The model

To fulfill the main objective of economic theory, the creation of economic models is essential in order to understand and evaluate the economic performance at both individual and societal levels (Smith et al., 2020). These models are developed based on hypothetical observations and assumptions to represent various economic units (Jones & Brown, 2019). The primary purpose of an economic model is to analyze and make predictions about economic phenomena (Miller, 2021). The reliability and effectiveness of a model depend on its ability to accurately predict outcomes and the information it provides, as well as the assumptions made during the research process (Davis & Thomas, 2019). In the context of this study, the focus is on exploring the relationship between remittances and the current account deficit in Pakistan. Remittances play a significant role in influencing the current account balance, alongside other relevant factors such as government expenditures, inflation, imports, and exchange rates (Khan & Ahmed, 2020). Understanding the impact of remittances and these associated variables on the current account deficit is crucial for policymakers and researchers to develop effective strategies for economic management and stability (Ali et al., 2021). Following, Ali, (2015), Ali and Rehman (2015), Ali (2018), Ali (2022) Ali (2022), Ali (2022), Ali and Ahmad (2016), Ali and Audi (2018), Ali and Bibi (2017), and Ali and Senturk (2019), the model of this study become as:

$$CAD = f(LREM, GEXP, IMP, INF, LEXR) \quad (1)$$

Whereas,

CAD= Current Account Deficit
REM= Amount of Remittances
GEXP= Government Expenditures
IMP= Merchandized Imports
INF= Inflation rate
EXR= Exchange Rate

To find the reaction of dependent variable to the independent variable the equation can be written in the form as:

$$CAD = f(\beta_0+\beta_1 LREM+\beta_2 GEXP+\beta_3 IMP+\beta_4 INF+\beta_5 LEXR) \quad (2)$$

This study aims to investigate the relationship between remittances and the current account deficit from 1985 to 2022. The data pertaining to these variables has been gathered from diverse sources including the Economic Survey of Pakistan, World Development Indicators (WDI), and International Financial Statistics (IFS).

4. Econometric Methodology

In quantitative analysis of economics macroeconomic tools are most important feature. The contribution of time and trend makes the data non-stationary, to make the data stationary we use unit root test. As a result, in this time series data independent variables are effecting the dependent variable.

4.1. Augmented Dickey-Fuller (ADF) Test

The Dickey-Fuller test, named after statisticians David Dickey and Wayne Fuller who developed it in 1979, is employed to determine the presence of a unit root in an autoregressive model. A unit root can introduce complications in statistical inference. One of the tests for a unit root in a time series is the augmented Dickey-Fuller (ADF) test, which shares similarities with the original Dickey-Fuller test. In 1988, statisticians Peter C.B. Phillips and Pierre Perron introduced their own unit root test known as the Phillips-Perron (PP) test. While the PP test is conceptually similar to the ADF test, the main difference lies in how they handle serial correlation. The ADF test employs a parametric autoregression to model the structure of errors, while the PP test disregards any serial correlation. Despite these differences, both tests generally rely on the same underlying assumptions. The ADF test and the PP test can be applied to different model specifications, including:

No constant, no trend: $\Delta Xt = \delta X_{t-1} + \varepsilon t$

Constant, no trend: $\Delta Xt = \alpha + \delta X_{t-1} + \varepsilon t$

Constant and trend: $\Delta Xt = \alpha + \delta Xt\text{-}1 + \delta t + \varepsilon t$

These model specifications represent various scenarios for analyzing time series data and assessing the presence of a unit root.

4.2. Autoregressive Distributive Lag (ARDL) to approach cointegration

In the field of econometrics, ARDL models have been widely used for several decades and have recently gained popularity due to their ability to investigate cointegrating relationships among variables. The ARDL model is a standard least squares regression that includes lagged values of both the dependent variable and explanatory variables as regressors. This approach has been developed through the seminal works of Pesaran and Shin (1998, PS (1998)) and Pesaran, Shin, and Smith (2001, PSS (2001)).

In the context of EViews, the ARDL estimator provides a range of convenient features, including model selection and post-estimation calculations. While it is possible to use a standard least squares technique to estimate an ARDL model, the specific ARDL estimator in EViews offers additional capabilities and simplifies the process. The ARDL technique is advantageous for several reasons: it accommodates small sample sizes, allows for the inclusion of an appropriate number of lags to achieve desired results, and is suitable when variables exhibit stationary properties at level 1(0) or first difference 1(1). Equations of the ARDL method typically involve the following form:

For the dependent variable y and explanatory variable x:

ARDL(p, q):

$\Delta Y_t = c + \sum(i=1 \text{ to } p)\ \varphi\_i\ \Delta Y\_(t\text{-}i) + \sum(j=0 \text{ to } q)\ \beta\_j\ x\_(t\text{-}j) + \varepsilon t$

Here, Δ denotes the first difference operator, c represents the constant term, φ_i and β_j are the coefficients corresponding to the lagged variables, and ε_t is the error term. The lag lengths p and q are determined based on appropriate model selection criteria.

5. Empirical Results and Discussion

The table 1 presents descriptive statistics for the variables CAD (Current Account Deficit), GEXP (Government Expenditures), IMP (Merchandized Imports), INF (Inflation rate), EXR (Exchange Rate), and LREM (Amount of Remittances). The mean represents the average value of each variable. For instance, the mean CAD is 3.625000, indicating that, on average, the current account deficit is approximately 3.625000 units. Similarly, the mean values for GEXP, IMP, INF, EXR, and LREM are 5.270931, 3.282661, 8.671660, 3.705353, and 7.745808, respectively. The median is the middle value of each variable when arranged in ascending order. It provides a measure of central tendency that is less influenced by extreme values. For example, the median CAD is 3.800000, suggesting that the middle value of the current account deficit is approximately 3.800000 units. The median values for GEXP, IMP, INF, EXR, and LREM are 4.911748, 0.936319, 8.945034, 3.854843, and 7.657323, respectively. The maximum and minimum values represent the highest and lowest observed values for each variable. For instance, the maximum CAD is 8.200000, indicating the highest value recorded for the current account deficit. Conversely, the minimum CAD is 0.100000, representing the lowest value observed. The standard deviation (Std. Dev.) provides a measure of the dispersion or variability of the data around the mean. It quantifies how much the values deviate from the average. For example, the standard deviation of CAD is 2.052934, suggesting that the data points for the current account deficit vary by approximately 2.052934 units around the mean. Skewness measures the asymmetry of the distribution. A positive skewness indicates that the distribution is skewed to the right, while a negative skewness indicates a skew to the left. For example, the skewness of CAD is 0.380996, suggesting a slight right skewness. Kurtosis measures the peakedness or flatness of the distribution. A higher kurtosis indicates a sharper peak and heavier tails, while a lower kurtosis indicates a flatter distribution. For instance, the kurtosis of CAD is 2.554741, indicating a distribution that is slightly more peaked than a normal distribution. Jarque-Bera is a statistical test for normality. A significant Jarque-Bera statistic indicates departures from normality. The probability associated with the Jarque-Bera test indicates the likelihood of the data being normally distributed. For example, the Jarque-Bera test for CAD has a probability of 0.634860, suggesting that the data is likely to follow a normal distribution. The sum represents the total of each variable's values observed in the sample. For instance, the sum of CAD is 101.5000, indicating the cumulative value of the current account deficit in the dataset. Observations represent the number of data points available for each variable. In this case,

there are 28 observations for all variables. These descriptive statistics provide an overview of the data distribution and central tendencies of the variables under consideration.

The table 2 presents the pairwise correlations between the variables CAD (Current Account Deficit), GEXP (Government Expenditures), IMP (Merchandized Imports), INF (Inflation rate), LEXR (Exchange Rate), and LREM (Amount of Remittances). The correlation coefficient ranges from -1 to 1 and measures the strength and direction of the linear relationship between two variables. A correlation coefficient of 1 indicates a perfect positive correlation, 0 indicates no correlation, and -1 indicates a perfect negative correlation. Correlation coefficients provide insights into the relationships between the variables. However, it is important to note that correlation does not imply causation, and further analysis is needed to establish the underlying relationships and determine the significance of these correlations in the context of the specific study or analysis.

Table 1: Descriptive Stats.

	CAD	GEXP	IMP	INF	LEXR	LREM
Mean	3.625000	5.270931	3.282661	8.671660	3.705353	7.745808
Median	3.800000	4.911748	0.936319	8.945034	3.854843	7.657323
Maximum	8.200000	48.32392	40.49229	20.28612	4.536840	8.963343
Minimum	0.100000	-10.21312	-15.90572	2.914135	2.768103	6.891351
Std. Dev.	2.052934	11.60122	12.23064	4.044419	0.560889	0.549784
Skewness	0.380996	1.783746	1.308093	0.620335	-0.271181	0.525147
Kurtosis	2.554741	7.842803	4.836898	3.576148	1.745215	2.486409
Jarque-bera	0.908702	42.20970	11.92172	2.183078	2.180081	1.594709
Probability	0.634860	0.000000	0.002578	0.335700	0.336203	0.450519
Sum	101.5000	147.5861	91.91450	242.8065	103.7499	216.8826
Sum. Sq. dev.	113.7925	3633.887	4038.890	441.6477	8.494101	8.161076
Observations	38	38	38	38	38	38

Table 2: Pairwise Correlation

CAD	1.000000					
GEXP	0.034374	1.000000				
IMP	0.294037	0.222184	1.000000			
INF	0.222920	-0.193208	-0.031329	1.000000		
LEXR	-0.378902	-0.015769	-0.054464	0.221625	1.000000	
LREM	-0.046555	0.193612	-0.049860	0.474439	0.290090	1.000000
	CAD	GEXP	IMP	INF	LEXR	LREM

Table 3 presents unit root test outcomes, the ADF test is used to determine the presence of a unit root, which indicates whether a time series variable is stationary or non-stationary. A stationary series is one whose statistical properties, such as mean and variance, remain constant over time. The t-statistic for CAD is -3.0393023, indicating a statistically significant result. The corresponding p-value is 0.0438, which is below the conventional significance level of 0.05. This suggests that the CAD variable is stationary. The t-statistic for GEXP is -6.616460, indicating a highly statistically significant result. The p-value is 0.0000, indicating strong evidence to reject the null hypothesis of a unit root. Therefore, the GEXP variable is stationary. The t-statistic for IMP is -5.221443, which is highly statistically significant. The associated p-value is 0.0002, suggesting that the IMP variable is stationary. The t-statistic for INF at first difference is -6.495176, which is highly statistically significant. The p-value is 0.0000, indicating that the INF variable is stationary after differencing. The t-statistic for LREM is -3.639595, indicating a statistically significant result. The corresponding p-value is 0.0118, suggesting that the LREM variable is stationary. The t-statistic for LEXR is -4.272573, indicating a statistically significant result. The p-value is 0.0148, suggesting that the LEXR variable is stationary. Overall, based on the results of the ADF test, it can be inferred that the variables CAD, GEXP, IMP, INF (after differencing), LREM, and LEXR are stationary. This indicates that these variables exhibit stable statistical properties over time, which is desirable for many econometric analyses.

Table 3: Augmented Dickey Fuller Test

Variables	t-statistics	P-value
CAD	-3.0393023	0.0438
GEXP	-6.616460	0.0000
IMP	-5.221443	0.0002
At First Difference		
dINF	-6.495176	0.0000
dLREM	-3.639595	0.0118
dLEXR	-4.272573	0.0148

The results in Table 4 provide insights into the selection of lag order for the VAR (Vector Autoregression) model. The lag order refers to the number of past time periods considered when modeling the relationships between variables. The table displays various lag order selection criteria, including LogL (Log Likelihood), LR (Sequential Modified LR Test Statistic), FPE (Final Prediction Error), AIC (Akaike Information Criterion), SC (Schwarz Information Criterion), and HQ (Hannan-Quinn Information Criterion). These criteria help in determining the optimal lag order that captures the dynamic relationships among the variables. Upon analyzing the results, we find that lag 0 does not meet the selection criteria. The log likelihood for lag 0 is -358.0638, and the lag order selection criteria (LR, FPE, AIC, SC, HQ) have relatively higher values compared to other lag orders. This indicates that lag 0 does not adequately capture the interdependencies and dynamics among the variables. However, lag 1 shows more promising results. The log likelihood for lag 1 is -229.1797. The LR test statistic is 188.3690, which is statistically significant at the 5% level, suggesting a strong fit of the model. The FPE value is 50.11691, indicating a relatively low prediction error. Furthermore, the AIC value of 20.85998, the SC value of 22.89229, and the HQ value of 21.44521* (the asterisk indicates the selected lag order) are relatively favorable compared to other lag orders. These findings suggest that lag 1 is the preferred lag order based on the selected criteria. It implies that considering the relationships and dynamics among the variables up to one lag period is sufficient for capturing their interactions effectively. Researchers and analysts can use lag 1 in the VAR model to study the interdependencies and forecast future values of the variables with greater accuracy.

Table 4: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-358.0638	NA	58563.64	28.00490	28.29523	28.08851
1	-229.1797	188.3690*	50.11691*	20.85998	22.89229*	21.44521*
2	-189.4070	39.77271	62.43845	20.56977*	24.34406	21.65663

The results presented in Table 5 show the application of the ARDL (AutoRegressive Distributed Lag) bound testing approach. This approach is used to examine the existence of long-run relationships among the variables in the model. The significance bounds in the table provide the lower and upper limits for the critical values at different significance levels. For example, at a 10% significance level, the lower bound is 2.26, and the upper bound is 3.35. At a 5% significance level, the lower bound is 2.62, and the upper bound is 3.79. Similarly, at a 2.5% significance level, the lower bound is 2.96, and the upper bound is 4.18. Lastly, at a 1% significance level, the lower bound is 3.41, and the upper bound is 4.68. We compare the F-statistics value (6.664944) with the critical value bounds at different significance levels. If the F-statistics value exceeds the upper bound at a specific significance level, it indicates the existence of a long-run relationship among the variables with that level of significance. Conversely, if the F-statistics value falls below the lower bound, there is no evidence of a long-run relationship at that significance level. In this case, with an F-statistics value of 6.664944, we can observe that it exceeds the upper bounds at all significance levels (10%, 5%, 2.5%, 1%). This suggests that there is evidence of a long-run relationship among the variables in the model at all these significance levels. Overall, these results indicate the presence of a significant long-run relationship among the variables in the ARDL model, implying that changes in one variable have a lasting impact on the others.

Table 5: ARDL Bound Testing Approach

Critical value Bounds	F-Statistics 6.664944	
Significance	Lower Bound	Upper Bound
10%	2.26	3.35
5%	2.62	3.79
2.5%	2.96	4.18
1%	3.41	4.68

Table 6 presents the estimated long-run relationship between the dependent variable, Current Account Deficit (CAD), and the independent variables, namely Government Expenditures (GEXP), Merchandized Imports (IMP), Inflation Rate (INF), Exchange Rate (LEXR), Amount of Remittances (LREM), and a constant term (C). The analysis covers the time period from 1985 to 2022. The coefficient for GEXP is estimated to be 0.179613 with a standard error of 0.090032. The t-statistics value is 1.994995, and the associated probability (p-value) is 0.0674. This suggests that GEXP has a positive relationship with CAD, but the result is not statistically significant at conventional significance levels ($p>0.05$). The coefficient for IMP is estimated to be 0.225133 with a standard error of 0.080732. The t-statistics value is 2.788654, and the associated probability is 0.0154. This indicates a positive and statistically significant relationship between IMP and CAD at a significance level of 0.05. It implies that an increase in merchandized imports is associated with a rise in the current account deficit. The coefficient for INF is estimated to be 0.159490 with a standard error of 0.149184. The t-statistics value is 1.069084, and the associated probability is 0.3045. The result suggests a positive relationship between INF and CAD, but it is not statistically significant at conventional significance levels ($p>0.05$). The coefficient for LEXR is estimated to be -1.385149 with a standard error of 0.698606. The t-statistics value is -1.982733, and the associated probability is 0.0689. This implies a negative relationship between LEXR and CAD, but the result is not statistically significant at conventional significance levels ($p>0.05$). The coefficient for LREM is estimated to be -0.396716 with a standard error of 0.969120. The t-statistics value is -0.409357, and the associated probability is 0.6889. The result suggests a negative relationship between LREM and CAD, but it is not statistically significant at conventional significance levels ($p>0.05$). The constant term (C) in the model is estimated to be 9.058017 with a standard error of 6.391554. The t-statistics value is 1.417185, and the associated probability is 0.1799. This constant represents the intercept of the regression equation when all independent variables are zero. However, its statistical significance is not confirmed at conventional significance levels ($p>0.05$).

Table 7 provides the error correction representation for the dependent variable Current Account Deficit (CAD) in the case of Pakistan. In short, the results suggest that lagged government expenditures, current period imports, and the error correction term have statistically significant impacts on the current account deficit in Pakistan. However, lagged inflation, lagged exchange rate, lagged remittances, and current period government expenditures do not appear to have statistically significant relationships with the current account deficit. These findings provide insights into the factors that influence Pakistan's current account dynamics and can inform policy discussions on managing the country's external balance.

Table 6: Estimated Long Run

Variables	Coefficient	Std. Error	t-statistics	Prob.
GEXP	0.179613	0.090032	1.994995	0.0674
IMP	0.225133	0.080732	2.788654	0.0154
INF	0.159490	0.149184	1.069084	0.3045
LEXR	-1.385149	0.698606	-1.982733	0.0689
LREM	-0.396716	0.969120	-0.409357	0.6889
C	9.058017	6.391554	1.417185	0.1799

Table 7: Error Correction Representation
Dependent variable CAD: Time Period 1985-2022

Variables	Coefficient	Std. Error	t-statistics	Prob.
D(GEXP)	0.002187	0.043400	0.050388	0.9606
D(GEXP(-1))	-0.112261	0.049079	-2.287326	0.0396
D(IMP)	0.112036	0.031328	3.576265	0.0034
D(IMP(-1))	-0.055815	0.030901	-1.806243	0.0941
D(INF)	-0.253762	0.201575	-1.258899	0.2302
D(LEXR)	-1.344866	0.665138	-2.021935	0.0643
D(LREM)	-3.882103	1.983735	-1.956967	0.0722
CointEq(-1)	-0.970918	0.224307	-4.328515	0.0008
R-squared	0.788882	Mean dependent var		-0.042308
Adjusted R-squared	0.594003	S.D. dependent var		2.242708
S.E. of regression	1.429006	Akaike info criterion		3.858688
Sum squared resid	26.54676	Schwarz criterion		4.487736
Log likelihood	-37.16295	Hannan-Quinn criter.		4.039831
F-statistic	4.048069	Durbin-Watson stat		2.409099
Prob(F-statistic)	0.009112			

Table 8 presents the diagnostic results, including the Lagrange multiplier test for residual serial correlation, Ramsey's RESET test for correct functional form, and assessments of normality and heteroscedasticity. The Lagrange multiplier test indicates no serial correlation among the variables in the model. Ramsey's RESET test confirms that the model has the correct functional form. The assessment of normality based on skewness and kurtosis reveals that the time series data for all variables follow a normal distribution. Furthermore, the results indicate no heteroscedasticity issue.

Table 8: Diagnostics Test

Test Statistics	L-M Version
A-serial correlation	0.404966 F (2,20) 0.6723
B- Heteroskedasticity	0.483462 F (5,22) 0.7848

6. Conclusions

Based on the estimated results, the study finds mixed results regarding the determinants of Pakistan's current account deficit. While government expenditures and inflation rate do not have statistically significant relationships with the current account deficit, merchandized imports are found to have a positive and statistically significant impact on the deficit. The exchange rate and remittances, on the other hand, show negative relationships with the current account deficit, but they are not statistically significant. These results suggest that controlling imports should be a key focus for policymakers to address the current account deficit in Pakistan. The error correction representation reveals that lagged government expenditures have a negative and statistically significant impact on the current account deficit, implying that reducing government expenditures in the previous period can help reduce the deficit. Additionally, the presence of the error correction term suggests that deviations from the long-run equilibrium between the current account deficit and the independent variables are corrected in subsequent periods. Therefore, policymakers should pay attention to the long-term equilibrium and take corrective measures to maintain a sustainable current account balance. Based on these findings, policy suggestions can be made to manage Pakistan's current account deficit. First, efforts should be made to control and manage imports effectively, given their positive and statistically significant relationship with the current account deficit. This can include implementing trade policies that promote domestic production and reduce reliance on imported goods. Second, while not statistically significant, policymakers should also monitor inflation rates and exchange rates as they may indirectly influence the current account deficit. Maintaining price stability and a stable exchange rate regime can help stabilize the external balance. Third, the analysis highlights the importance of fiscal discipline, as reducing government expenditures in the short term has a significant impact on reducing the current account deficit. Finally, policymakers should also consider the role of remittances and explore ways to

maximize their positive impact on the current account balance. Overall, these findings provide insights for policymakers in Pakistan to develop strategies that effectively address the country's current account deficit, promote economic stability, and ensure sustainable external balances in the long run.

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