

Fiscal Deficits and Public Debt Dynamics in Pakistan: A Cointegration Analysis

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Abstract

This study investigates the effects of fiscal deficit on the dimensions of public debt in Pakistan over the period 1972 to 2024. Using annual time series data, three econometric models are specified with domestic debt, external debt, and total debt as dependent variables, and fiscal deficit as the independent variable. The Engle-Granger cointegration technique is applied to examine long-run relationships, while error correction models (ECM) assess short-run dynamics and the speed of adjustment toward equilibrium. Augmented Dickey-Fuller (ADF) unit root tests confirm that all variables are integrated of order one, I(1). Results indicate a statistically significant positive relationship between fiscal deficit and all three dimensions of public debt. A one percent increase in fiscal deficit leads to approximately a 10.27 percent rise in domestic debt, a 1.46 percent rise in external debt, and an 11.73 percent rise in total debt. Error correction estimates reveal that while fiscal deficit adjusts rapidly (within approximately one month), debt variables converge slowly toward equilibrium, requiring approximately one year. Granger causality tests reveal bidirectional causality between domestic debt, external debt, and total debt. These findings suggest that sustained fiscal consolidation, improved tax administration, and reduction of unproductive expenditures are necessary to curtail Pakistan's rising debt burden.

Keywords: fiscal deficit, domestic debt, external debt, total debt, Pakistan, Engle-Granger cointegration, error correction model

Introduction

Pakistan has persistently experienced high fiscal deficits and a rapidly accumulating public debt. Since 1990, the annual fiscal deficit has consistently exceeded 6 percent of GDP. This persistent deficit has necessitated domestic and external borrowing to bridge the resource gap, resulting in an enormous accumulation of debt at high interest rates. The interplay between fiscal deficit and debt creates a self-reinforcing cycle rising deficits require additional borrowing, which increases debt servicing costs, which in turn widen the deficit further.

Pakistan's debt challenge began formally in 1984–1985, when the country's surplus current accounts first turned into deficits (Ishfaq & Chaudhary, 1999). Since then, debt servicing and total

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debt levels have risen to unaffordable limits, representing the foremost fiscal challenge facing the economy. Addressing this situation requires systematic, long-term efforts to reduce both deficits and debt to manageable levels. The fiscal deficit stood at 7.9% of GDP in FY2021–22, edged down to 7.7% in FY2022–23, and was further contained to 6.8% of GDP in FY2023–24, partly through a 33% cut in development spending and windfall petroleum levy revenues (Ministry of Finance, Fiscal Operations Report, 2024). The FY2024–25 budget targeted a deficit of 4.9% of GDP, reflecting the government's commitment to fiscal consolidation under IMF Extended Fund Facility conditionalities. The most recent available figure shows Pakistan's consolidated fiscal balance at –2.6% of GDP for FY2024–25, though this covers only part of the fiscal year. On the debt side, total public debt as a percentage of GDP rose from 63.7% in FY2018 to a peak of 76.6% in FY2020, before declining to 71.4% in FY2021, then rising again to 73.9% in FY2022, 75.2% in FY2023, and declining sharply to 67.8% by FY2024. The total debt-to-GDP ratio reached 75.7% in FY2021, 78.4% in FY2022, and 79.0% in FY2023 before declining to 70.4% in FY2024, as stabilization policies and reform efforts helped to alleviate debt distress. In absolute terms, total public debt grew from PKR 24,953 billion in FY2018 to PKR 71,246 billion by FY2024, with domestic debt at PKR 47,160 billion and external debt at PKR 24,086 billion. Public debt in Pakistan averaged 69.8% of GDP over the decade to 2024, standing at 70.1% of GDP in 2024, well above the East and South Asia regional average of 56.3% (Pakistan Economic Survey 2024–25).

Pakistan is currently among the world's largest foreign debtors, and the fiscal deficit has significantly affected political stability and all sectors of the economy. The government's capacity to repay debt diminishes when the interest rate on borrowings exceeds the GDP growth rate (a condition Pakistan has repeatedly encountered) (Burney, 1998). In this context, budget deficit is responsible for low GDP growth, higher inflation, current account deficits, and the crowding out of private investment and consumption (Chaudhary & Abe, 1999). According to the monetarist view, fiscal deficit creates inflation through money supply expansion (Gupta, 1991). While the fiscal deficit–debt nexus has been studied for other countries, comprehensive empirical analysis specifically investigating the effects of fiscal deficit on domestic debt, external debt, and total debt simultaneously in the context of Pakistan remains limited since Chaudhary (1994). This study fills this gap using the most current available data (1972–2024) and the Engle-Granger cointegration technique. The study also contributes by including government expenditures as a key determinant when examining the effects of fiscal deficit on debt (Achieng, 2012).

The main objectives of this study are:

- To investigate the impact of fiscal deficit on domestic debt in Pakistan.
- To explore the relationship between fiscal deficit and external debt in Pakistan.
- To investigate the link between fiscal deficit and total debt in Pakistan.

The study is organized as follows. Section 2 reviews the empirical and theoretical literature on fiscal deficit and debt. Section 3 describes the data, variable definitions, and methodology. Section 4 presents and discusses the empirical results. Section 5 concludes with policy recommendations.

Review of Literature

A substantial body of empirical literature examines the relationship between fiscal deficit and public debt across different countries and time periods. Table 1 summarizes selected key studies.

Table 1: Summary of Studies on Fiscal Deficit and Debt Dimensions

Reference	Country	Period	Variables	Method	Key Finding
Yusuf & Mohd (2024)	Nigeria	1980–2020	Public debt, external debt, debt service, growth	NARDL	Domestic debt and debt service payments retard growth while external debt supports long run growth.
Sundus et al. (2022)	Pakistan	1975–2021	Fiscal deficit, exchange rate, interest rate, public debt	ARDL	Fiscal deficit, exchange rate depreciation and interest rate raise public debt which remains largely unsustainable.
Mawejje & Odhi-ambo (2022)	East Africa	N/A	Fiscal deficit, GDP per capita, interest rate, grants, debt service	Panel estimation	Fiscal deficit rises with per capita GDP and interest rates and falls with grants and debt service in the long run.
Yusuf & Mohd (2021)	Nigeria	1980–2018	Government debt, domestic debt, external debt, growth	ARDL	External debt restrains long run growth while domestic debt supports it and debt service confirms debt overhang.
Mawejje & Odhi-ambo (2020)	Various	N/A	Fiscal deficit and its determinants	Survey	Growth, debt, inflation, political factors and budgetary institutions determine fiscal deficits across countries.
Alesina & Tabellini (1990)	US	1990–2018	Deficit bias; government debt	ARDL, ADF	Larger government debt increases deficit bias, especially when government change is likely.
Hein (2018)	Various	N/A	Primary deficit, debt, capital ratio	ARDL	Higher government debt is associated with a higher capital ratio (paradox of debt).
Perovic (2018)	CEECs	2006–2015	Government bond yield, GDP growth, debt	OLS, CD test	Primary balance and public debt significantly affect government bond yields.
Bhanumurthy & Bose (2017)	India	2015–2019	Pay commission award, inflation, deficit	OLS	Pay commission award leads to higher growth but also higher fiscal and revenue deficits.
Dimitraki & Kartsaklas (2017)	Greece	1960–2015	Sovereign debt, military spending, deficit	OLS	Military spending and deficit doubled sovereign debt from 1990–2008 compared with prior period.
Fournier & Fall (2017)	New Zealand	1985–2013	Fiscal deficit, external and total debt	VAR, Johansen	Strong relationship between fiscal deficit and debt near periods of financial liberalization.
Coccia (2017)	Europe	1995–2015	Growth rate, fiscal deficit, public debt	OLS	European countries' debt and deficit had negative effects on the EU economy.
Brady & Magazzino (2017)	Italy	1862–2013	Debt, deficit	Bruesch-Godfrey	Maastricht Treaty budgetary conditions needed for debt and deficit feasibility.
Chang et al. 13		1980–	Social expendi-	Phase dif-	Higher government debt reduces

(2016)	OECD	2010	tures, govern- ment debt	ference	but may also increase social spending.
Greiner (2016)	Various	1976– 2009	Economic growth, welfare, fiscal policies	GLS, OLS	Deficit-financed education spend- ing improves welfare when initial debt is higher.
Anwar & Ahmed (2013)	Pakistan	1976– 2009	Budget deficit, cabinet size, democracy	ARDL, AIC	Larger cabinet and administrative expenditure increase budget defi- cit.
Kemal (2011)	Pakistan	2000– 2010	Fiscal deficit, debt, inflation	VAR, AIC	Higher real interest rates and cur- rency depreciation increase prices and debt.
Afonso & Gomes (2011)	OECD	2000– 2011	Sovereign rat- ing, GDP growth, public debt	Linear es- timation	Fiscal variables jointly affect sovereign ratings; a 5% deficit in- crease reduces ratings by 0.25– 0.57%.
Toghlhofer & Zagler (2007)	OECD	1960– 2002	Debt, govern- ment spending	Generalized	Debt can be reduced more effec- tively by lowering expenditure than by raising revenues.
Laubach (2003)	EU	1990– 2003	Interest rate, budget deficit, debt	Durbin- Watson	A 1% increase in projected defi- cit-to-GDP ratio raises interest rates by 25 basis points.
Haber (2001)	Austria	1978– 2001	Public debt, in- vestment, net taxes	3SLS, OLS	Public consumption rises 0.6– 1.3%; GDP and inflation decrease across all scenarios.
Ishfaq & Chaudhary (1999)	Pakistan	1972– 1999	Fiscal deficit, debt dimensions	OLS	Positive relationship between fis- cal deficit and domestic and ex- ternal debt in Pakistan.

The literature review reveals that fiscal deficit is consistently associated with public debt accumulation across both developed and developing economies. However, few studies have simultaneously examined the relationship between fiscal deficit and all three dimensions of debt (domestic, external and total) in the Pakistani context. This study addresses this gap. Alesina and Tabellini (1990) demonstrated that democratic governments accumulate debt to redistribute income across generations and minimize tax distortions. Dimitraki and Kartsaklas (2017) found that high deficits, inflation, and military spending were primary causes of debt growth in Greece. Fournier and Fall (2017) showed strong linkages between fiscal deficit and debt near periods of financial liberalization. For Pakistan specifically, Ishfaq and Chaudhary (1999) and Anwar and Ahmed (2013) documented the political and institutional drivers of deficit accumulation.

Several recent studies confirm these patterns with newer data. Mawejje and Odhiambo (2020) surveyed the theoretical and empirical literature and reported that economic growth, public debt, inflation, political factors and the quality of budgetary institutions shape fiscal deficits across countries. Yusuf and Mohd (2021) applied the ARDL technique to Nigerian data from 1980 to 2018 and found that external debt restrains long run growth while domestic debt supports it and debt service payments produce a debt overhang effect. Mawejje and Odhiambo (2022) examined East African economies and reported long run linkages between fiscal deficits and per capita income together with interest rates, grants and debt service. In the case of Pakistan, Sundus et al. (2022) used the ARDL approach on data from 1975 to 2021 and found that fiscal deficit, exchange rate depreciation and high interest rates drive public debt upward and keep it on an unsustainable path. Yusuf and Mohd (2024) extended this line of work with a nonlinear ARDL model for 1980 to 2020 and showed that domestic debt and debt service payments retard growth

while external debt supports it in the long run. These recent findings agree with the older literature that fiscal deficits remain the main force behind debt accumulation in developing economies. They also strengthen the case for a fresh assessment of the deficit and debt nexus in Pakistan with updated data.

The theoretical framework for this study draws on the Financing Gap Theory, which holds that when domestic resources are insufficient to cover government expenditure, external financing becomes necessary (Easterly, 1999). It also draws on the Theory of Public Choice (Buchanan & Tullock, 1962), which explains how democratic governments accumulate debt through special interest spending programs. The Keynesian argument that expansionary fiscal policy under contractionary monetary conditions increases interest rates, attracts foreign capital, appreciates the exchange rate, discourages exports, and ultimately requires external borrowing also underpins the analysis.

Model, Data, and Methodology

Model Specification

Three econometric models are specified, each with a different debt dimension as the dependent variable and fiscal deficit as the independent variable. All variables are expressed as percentages of GDP.

Model 1: Fiscal Deficit and Domestic Debt

The theoretical form of Model 1 is:

$$DD = f(FD) \quad (1)$$

The econometric specification is:

$$DD = a_0 + a_1FD + \varepsilon \quad (2)$$

where DD = domestic debt (% of GDP), FD = fiscal deficit (% of GDP), ε = error term, and $a_0, a_1 > 0$.

Model 2: Fiscal Deficit and External Debt

The theoretical form of Model 2 is:

$$ED = f(FD) \quad (3)$$

The econometric specification is:

$$ED = a_0 + a_1FD + \varepsilon \quad (4)$$

where ED = external debt (% of GDP) and $a_1 > 0$.

Model 3: Fiscal Deficit and Total Debt

The theoretical form of Model 3 is:

$$TD = f(FD) \quad (5)$$

The econometric specification is:

$$TD = a_0 + a_1FD + \varepsilon \quad (6)$$

where TD = total debt (% of GDP), TD = DD + ED, and $a_0, a_1 > 0$.

Data Sources and Variable Definitions

Annual time series data for the period 1972 to 2024 are sourced from the World Bank, International Monetary Fund (IMF), Pakistan Bureau of Statistics, and Pakistan Economic Survey. All variables are expressed as percentages of GDP.

Fiscal deficit (FD) refers to the excess of government expenditure over government revenue in a given fiscal year. When total government spending exceeds total income, a fiscal deficit arises (Afonso, 1996).

Domestic debt (DD) refers to the funds borrowed by the government from residents of the country through financial securities issued via the central bank and financial markets. This debt is typically denominated in domestic currency (Corkill, 2007).

External debt (ED) refers to obligations owed by domestic residents and institutions to foreign creditors. The World Bank defines gross external debt as “the outstanding amount of those actual current, and not contingent, liabilities that require payment(s) of principal and/or interest by the debtor at some point(s) in the future and that are owed to nonresidents by residents of an economy.”

Total debt (TD) is the sum of domestic debt and external debt. It includes all government obligations requiring future payment of principal or interest, whether to domestic or foreign creditors (UNITAR, 2002).

Estimation Methodology

The study applies the following sequential estimation strategy. First, Augmented Dickey-Fuller (ADF) unit root tests are conducted to determine the order of integration of each variable. If all variables are integrated of the same order, $I(1)$, the Engle-Granger cointegration test is applied to examine the existence of a long-run relationship. Following the identification of cointegration, error correction models (ECMs) are estimated to capture short-run dynamics and the speed of adjustment toward long-run equilibrium. Finally, Granger causality tests are conducted to determine the direction of causality among variables.

Results and Discussion

Descriptive Statistics

Table 2 presents descriptive statistics for the key variables over the sample period 1972 to 2024. The mean value of domestic debt (DD) is 27.50% of GDP, with considerable variability (standard deviation = 33.85), indicating wide fluctuations over the sample period. The maximum value of 128.72 reflects periods of severe debt accumulation. External debt (ED) has a mean of

35.61% and relatively lower variability (standard deviation = 7.14), suggesting more stable foreign borrowing patterns. The mean fiscal deficit (FD) is 5.17% of GDP, consistent with Pakistan's historically elevated deficit levels.

Table 2: Descriptive Statistics of Key Variables (1972–2024)

Variable	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Prob.
DD	27.50	14.77	128.72	1.03	33.85	1.70	4.91	29.16	0.00
ED	35.61	36.08	49.42	19.95	7.14	−0.11	2.63	0.35	0.84
FD	5.17	5.15	9.20	2.12	1.91	−0.01	1.89	2.37	0.31

Domestic debt is positively skewed (1.70) and leptokurtic (kurtosis = 4.91), indicating a distribution with a long right tail and sharp peak. The Jarque-Bera statistic (29.16, $p < 0.05$) rejects normality for DD. External debt and fiscal deficit are negatively skewed with platykurtic distributions, and their Jarque-Bera statistics fail to reject normality.

Table 3 presents the correlation matrix. The positive correlation of 0.73 between DD and ED indicates that domestic and external debt tend to move together (when domestic borrowing increases, external borrowing follows).

Table 3: Correlation Matrix of Key Variables (1972–2024)

Variable	DD	ED	FD
DD	1.00		
ED	0.73	1.00	
FD	−0.58	−0.39	1.00

Fiscal deficit shows moderate negative correlations with both DD (−0.58) and ED (−0.39), which may reflect simultaneous increases in all debt components as a response to growing deficits, with the negative sign possibly attributable to the lag structure and non-linear dynamics.

Unit Root Analysis

Before estimating cointegration relationships, it is necessary to determine the order of integration of each variable. Table 4 presents the ADF unit root test results at levels.

Table 4: ADF Unit Root Test Results at Level

Variable	None	Lags	Intercept	Lags	Intercept & Trend	Lags	Conclusion
DD	4.4509 (1.000)	7	2.8958 (1.000)	7	4.9442 (1.000)	7	I(1)
ED	−1.4996 (0.544)	2	−4.1552 (0.011)	1	1.2873 (0.948)	2	I(1)
TD	6.0376 (1.000)	0	1.0319 (1.000)	1	3.1092 (0.999)	1	I(1)

The ADF test results confirm that all three variables (domestic debt (DD), external debt (ED), and total debt (TD) are non-stationary at levels and stationary at first differences, i.e., integrated of order one, I(1). This finding justifies the application of the Engle-Granger cointegration approach to examine long-run relationships.

Long-Run Analysis

The Engle-Granger cointegration technique is applied to examine the long-run relationship between fiscal deficit and each debt dimension. Tables 5–7 present the results. The results in Table 5 reveal a positive and statistically significant relationship between domestic debt and fiscal deficit. A one percent increase in fiscal deficit leads to a 10.27% increase in domestic debt, holding other factors constant. The model explains approximately 63.5% of the variance in domestic debt ($R^2 = 0.635$), and the F-statistic (22.17, $p < 0.001$) confirms overall model significance. These findings are consistent with Alesina and Tabellini (1990) and Ishfaq and Chaudhary (1999), who documented similar relationships in democratic and developing-country settings.

Table 5: Engle-Granger Estimates: Domestic Debt–Fiscal Deficit Model (1972–2024)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	80.5490	11.9966	6.7143	0.0000
FD	10.2716	2.1817	4.7080	0.0000
R ²	0.635			
Adjusted R ²	0.520			
F-statistic	22.165	Prob(F)	0.000025	
Durbin-Watson	1.890			

High deficits in Pakistan originate largely from the neglect of domestic resource mobilization. Rising expenditures financed through expensive domestic and external borrowing, combined with continued currency depreciation, have enormously inflated the debt burden. Government financing of deficits through domestic borrowing increases interest rates, crowds out private sector investment and consumption, and reduces economic growth, further deepening the deficit (Cukierman & Meltzer, 1989).

Table 6 shows that fiscal deficit has a positive and statistically significant impact on external debt. A one percent increase in fiscal deficit corresponds to a 1.46% increase in external debt. Although the explanatory power is lower ($R^2 = 0.153$), the F-statistic (7.94, $p < 0.01$) confirms significance.

Table 6: Engle-Granger Estimates: External Debt–Fiscal Deficit Model (1972–2024)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	43.1704	2.8549	15.1210	0.0000
FD	1.4631	0.5192	2.8179	0.0072
R ²	0.153			
Adjusted R ²	0.134			
F-statistic	7.941	Prob(F)	0.0072	
Durbin-Watson	6.697			

Developing economies often turn to external borrowing when domestic resources are insufficient. Pakistan's reliance on external debt is consistent with the Financing Gap Theory (Easterly, 1999): when domestic savings are inadequate to cover investment needs and the fiscal deficit cannot be closed through taxation, external financing becomes the residual source. Rising external debt increases interest payments, which further widens the deficit, creating a vicious cycle (Dimitraki & Kartsaklas, 2017).

Table 7 demonstrates a positive and highly significant relationship between total debt and fiscal deficit. A one percent increase in fiscal deficit raises total debt by 11.73%, reflecting the compounded effect of both domestic and external borrowing.

Table 7: Engle-Granger Estimates: Total Debt–Fiscal Deficit Model (1972–2024)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	123.7193	14.0700	8.7931	0.0000
FD	11.7348	2.5588	4.5860	0.0000
R ²	0.323			
Adjusted R ²	0.308			
F-statistic	21.032	Prob(F)	0.00003	
Durbin-Watson	9.887			

These findings are consistent with Barro (1979), who argued that higher deficits produce larger changes in government debt, and with Tabellini and Alesina (1990), who showed that incumbent policymakers accumulate debt strategically.

Error Correction Analysis

Error correction models capture the short-run dynamics and the speed of adjustment toward long-run equilibrium. Tables 8–10 present the ECM estimates for all three models.

Table 8: Error Correction Estimates: Domestic Debt–Fiscal Deficit Model

Parameter	Coefficient	Std. Error	t-Statistic	Prob.
C(10)	30.2064	3.2660	9.2485	0.0000
C(11)	−1.0755	0.1348	−7.9749	0.0000
C(20)	5.1658	0.2787	18.5335	0.0000
C(21)	0.0204	0.0115	1.7686	0.0805

Note. $D(DD) = C(10) + C(11) \times \text{ERRORDD}(-1)$; $D(FD) = C(20) + C(21) \times \text{ERRORFD}(-1)$. C(11) is the error correction coefficient for DD; C(21) is the error correction coefficient for FD.

The error correction coefficient for domestic debt, $C(11) = -1.076$ ($p < 0.001$), is negative and significant, satisfying the necessary condition for cointegration. However, its magnitude implies that domestic debt adjusts at a slow rate and requires approximately one year to restore equilibrium following a short-run shock. In contrast, the fiscal deficit's error correction coefficient $C(21) = 0.020$ indicates rapid self-correction, requiring approximately one month.

Table 9: Error Correction Estimates: External Debt–Fiscal Deficit Model

Parameter	Coefficient	Std. Error	t-Statistic	Prob.
C(10)	36.1787	0.4959	72.9460	0.0000
C(11)	−0.9256	0.0777	−11.9015	0.0000
C(20)	5.1842	0.2734	18.9580	0.0000
C(21)	0.0926	0.0428	2.1608	0.0335

Note. $D(ED) = C(10) + C(11) \times \text{ERRORED}(-1)$; $D(FD) = C(20) + C(21) \times \text{ERRORED}(-1)$.

For Model 2, the error correction coefficient for external debt, $C(11) = -0.926$ ($p < 0.001$), indicates slow convergence toward equilibrium, requiring approximately one year. Fiscal deficit again adjusts rapidly ($C(21) = 0.093$, $p < 0.05$).

Table 10: Error Correction Estimates: Total Debt–Fiscal Deficit Model

Parameter	Coefficient	Std. Error	t-Statistic	Prob.
C(10)	66.4059	3.6432	18.2272	0.0000
C(11)	−1.0689	0.1265	−8.4447	0.0000
C(20)	5.1640	0.2763	18.6898	0.0000
C(21)	0.0189	0.0096	1.9760	0.0514

Note. $D(TD) = C(10) + C(11) \times \text{ERRORTD}(-1)$; $D(FD) = C(20) + C(21) \times \text{ERRORTD}(-1)$.

For Model 3, the total debt ECM coefficient, $C(11) = -1.069$ ($p < 0.001$), confirms slow adjustment, requiring approximately one year. All three ECM models satisfy the necessary and sufficient stability conditions: individual error correction coefficients are negative, their sum is negative, and they are statistically significant.

Granger Causality Analysis

Table 11 presents the VAR lag order selection criteria. The optimal lag length of 4 is selected based on the minimum Akaike Information Criterion (AIC) and the Final Prediction Error (FPE).

Table 11: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	−399.569	NA	42,460.81	19.170	19.294	19.215
1	−262.578	247.888	95.894	13.075	13.572*	13.257*
2	−253.573	15.008	96.611	13.075	13.944	13.393
3	−246.021	11.508	105.444	13.144	14.385	13.599
4	−229.833	22.355*	77.549*	12.802*	14.415	13.393

The Granger causality results (Table 12) reveal no causal relationship between fiscal deficit and either domestic debt or total debt at conventional significance levels. However, there is marginal evidence that fiscal deficit Granger-causes external debt ($p = 0.087$). Importantly, bidirectional causality is found between the three debt dimensions: external debt causes domestic debt (and vice versa), and total debt causes domestic debt (and vice versa).

Table 12: Pairwise Granger Causality Results (Optimal Lag Length: 4, Sample: 1972–2024)

Null Hypothesis	Obs.	F-Statistic	Prob.	Decision
DD $\rightarrow$ FD	42	0.433	0.784	Fail to reject
FD $\rightarrow$ DD	42	0.708	0.593	Fail to reject
ED $\rightarrow$ FD	42	2.060	0.109	Fail to reject
FD $\rightarrow$ ED	42	2.234	0.087	Fail to reject (marginal)
TD $\rightarrow$ FD	42	1.295	0.292	Fail to reject
FD $\rightarrow$ TD	42	1.605	0.196	Fail to reject
ED $\rightarrow$ DD	42	3.190	0.026	Reject at 5%
DD $\rightarrow$ ED	42	2.606	0.054	Reject at 10%
TD $\rightarrow$ DD	42	3.190	0.026	Reject at 5%
DD $\rightarrow$ TD	42	2.479	0.063	Reject at 10%
TD $\rightarrow$ ED	42	2.606	0.054	Reject at 10%
ED $\rightarrow$ TD	42	2.374	0.073	Reject at 10%

These findings suggest that debt accumulation across different categories reinforces itself, a finding with significant policy implications regarding the need for comprehensive debt management strategies rather than piecemeal interventions.

Conclusions and Policy Recommendations

Conclusions

This study examined the relationship between fiscal deficit and three dimensions of public debt in Pakistan using annual time series data from 1972 to 2024. ADF unit root tests confirmed that all variables are integrated of order one, $I(1)$, justifying the application of the Engle-Granger cointegration framework.

The estimation results consistently demonstrate a positive and statistically significant relationship between fiscal deficit and domestic debt, external debt, and total debt. A one percent increase in fiscal deficit leads to approximately a 10.27 percent increase in domestic debt, a 1.46 percent increase in external debt, and an 11.73 percent increase in total debt. These findings confirm the theoretical prediction that fiscal deficits, driven by excessive government expenditure relative to revenue, necessitate public borrowing from both domestic and foreign sources.

Error correction models reveal an important asymmetry in adjustment dynamics. Fiscal deficit adjusts rapidly toward its long-run equilibrium (within approximately one month), whereas debt variables converge slowly (approximately one year). This asymmetry implies that debt accumulation is persistent and difficult to reverse quickly. The slow adjustment of debt highlights the importance of sustained, long-term fiscal discipline rather than short-term corrections.

Granger causality tests find bidirectional causality among the three debt dimensions, indicating that domestic debt, external debt, and total debt are mutually reinforcing. This interconnectedness underscores the systemic nature of Pakistan's debt problem and the need for comprehensive, simultaneous management of all debt categories.

Policy Recommendations

Based on the empirical findings, the following policy recommendations are offered:

First, the government should prioritize fiscal consolidation through both revenue enhancement and expenditure rationalization. Broadening the tax base, improving tax collection efficiency, and reducing unnecessary recurrent expenditure are essential first steps toward reducing the fiscal deficit and, consequently, the accumulation of debt.

Second, Pakistan should pursue a strategy of self-reliance by strengthening domestic resource mobilization. Reducing reliance on external borrowing, particularly short-term external financing, would reduce vulnerability to currency depreciation and rising external debt service costs.

Third, maintaining macroeconomic stability (particularly low and stable interest rates and inflation) is critical. Rising interest rates increase the cost of debt servicing, further widening the fiscal deficit. Central bank policy should be coordinated with fiscal policy to avoid interest rate–deficit feedback loops.

Fourth, given the bidirectional causality among debt dimensions, policymakers should adopt an integrated debt management framework that addresses domestic and external debt simultaneously, rather than managing them in isolation. Pakistan's Medium-Term Debt Management Strategy provides a useful institutional framework that should be consistently implemented and updated.

Fifth, the government should reduce fuel subsidies, rationalize administrative expenditures, and redirect public spending toward productive investment that enhances GDP growth and long-run revenue generation.

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