Kashmir Economic Review
ISSN(P): 1011-081X, ISSN(E): 2706-9516
http://www.ker.org.pk

# Investigating Pakistan's Debt Sustainability and Debt Management: An Econometric Analysis


## *ABSTRACT*

As an indebted country, Pakistan has observed the substantial and persistent increase in its debt burden over the years. This study aims to empirically investigate the impact of public and external debt on the primary balance, while emphasizing the need to break the cycle of reliance on the foreign aid and external borrowing. Using annual data from 1973 to 2022, the study employs breakeven unit root test to identify the potential structural shocks and applies the Two-Stage Least Squares (2SLS) estimation technique to ensure robust empirical findings. Regression results reveal that public debt negatively and significantly affects the primary balance, whereas external debt has an insignificant impact. Debt sustainability analysis suggests that Pakistan has experienced the unsustainable debt management throughout. However, decades 1973–1982 and 1993–2002 demonstrate partial fulfillment of debt stabilization conditions, with the primary balances remaining non-negative, though necessary condition was not consistently met. Graphical analysis further reveals the lack of persistent debt sustainability in the presence of primary deficits. This study recommends that to achieve the sustainable debt levels, policymakers must focus on the economic diversification, export promotion, fiscal responsibility, and transparent governance. Complementary strategies, including risk management, targeted subsidies, and the international cooperation, are essential for fostering the long-term financial independence.



## *AUTHORS*

***Ambreen Fatemah****
Ph.D. Econometrics Scholar, Pakistan Institute of Development Economics, Islamabad, Pakistan.
Author's Contributions: 1,2,3,4,5,6,7
ambreen.fatemah@gmail.com
https://orcid.org/0000-0001-7158-7118



**Keywords**

Debt sustainability, primary balance, public debt, external debt, and structural break

**JEL Classification**

F0; F4; H3; H6

**Please cite this article as:**

Fatemah, A. (2024). Investigating Pakistan's debt sustainability and debt management: An econometric analysis. *Kashmir Economic Review*, 33(2), 17-29.



*** Correspondence author**


**Author's contribution in the article:** 1- Conceived and designed the analysis, 2- Reviewed and compiled the literature, 3- Collected the data, 4- Contributed data or analysis tools, 5- Performed the analysis, 6- Wrote the paper, 7- Financial support for the conduct of the study, 8-Other

# 1. INTRODUCTION

Debt sustainability refers to a country's ability to meet its current and future debt obligations without resorting to exceptional financing or compromising long-term economic stability (Lesage et al., 2013). In the Pakistan's case, this issue has grown critical over the past five decades due to the persistent fiscal imbalances, weak public financial management, and heavy dependence on the external borrowing (Mahmood et al., 2009; Hussain & Idrees, 2019; Bandiera & Tsiropoulos, 2020). These vulnerabilities have led to recurring the debt cycles and macroeconomic instability, undermining investor confidence and limiting the policy space.

Since 1970s, successive Pakistani governments have struggled to maintain a sustainable debt profile. Political transitions, structural inefficiencies, and the external shocks such as oil crises, geopolitical tensions, and natural disasters have compounded country's fiscal burden (Bird, 2007; Ejaz & Hyder, 2019). Pakistan's public debt reached 87% of the GDP well above 60% threshold defined in the Fiscal Responsibility and Debt Limitation (FRDL) Act, 2005 indicating the persistent solvency concerns (Ampofo et al., 2021; Roubini, 2001).

Debt Sustainability Analysis (DSA) framework, employed by the International Monetary Fund (IMF), provides a systematic approach to assess whether the fiscal and macroeconomic conditions can support existing debt levels. This study adopts that framework to evaluate the debt sustainability over the period 1973–2022 as an extension of the macro-econometric model by Fatemah and Haq (2024), with a specific focus on influence of the public and external debt on Pakistan's primary balance. It integrates structural break analysis and accounting approach (using the conditions $r < g$ and primary balance $\geq 0$) to assess whether the debt dynamics have been sustainable over the time (Mendoza & Ostry, 2008; Mahmood et al., 2009).

Unlike previous literature that isolates debt indicators, this study offers a multidimensional assessment by combining empirical estimation using Two-Stage Least Squares (2SLS), structural break tests, and historical regime analysis. The novelty lies in analyzing how different political regimes, macroeconomic shocks, and policy inconsistencies have shaped debt sustainability trends over five decades (Ghosh et al., 2011). The main objectives of this study are to empirically evaluate the effect of public and external debt on the primary fiscal balance and to identify key structural shocks and fiscal discontinuities (Forgha et al., 2014). The paper will also assess Pakistan's debt sustainability through both econometric and accounting-based approaches. By doing so, the paper provides evidence-based insights for policymakers on the conditions necessary to achieve long-term fiscal discipline and reduce dependency on external financing.

The rest of the paper is organized as follows: Section 2 reviews the existing literature on debt sustainability and fiscal policy. Section 3 describes theoretical and empirical models, including data sources and estimation techniques. Section 4 presents and interprets results, including structural breaks and the sustainability assessments. Finally, Section 5 concludes with the key policy recommendations and suggestions for the future research.

# 2. LITERATURE REVIEW

Debt sustainability has long been a central concern for the developing economies, where fiscal imbalances, structural inefficiencies, and the political instability often lead to unsustainable debt paths (Ormaechea & Martinez, 2021). Early theoretical models, including those by Modigliani (1961) and the Barro (1979), emphasized long-term implications of the public borrowing and inter-generational debt burden. These ideas were further developed by the Bohn (1998, 2008), who introduced fiscal reaction functions to empirically test whether the governments adjust their primary balances in response to the rising debt (Cecchetti et al., 2010). Mahmood et al. (2009) applied these concepts to

Pakistan and found recurring periods of the unsustainable debt due to weak fiscal performance and heavy reliance on short-term borrowing.

Several empirical studies have examined the role of the external debt and donor dependency in weakening fiscal resilience (Hussain & Idrees, 2015**)**. For instance, (Anwer, 2000; Bond, 2020; Bresser-Pereira, 2022) argued that the structural adjustment programs by institutions like IMF and World Bank often reinforce the fiscal rigidity, limiting domestic policy autonomy. Similar concerns were echoed by the (Conway, 2006; Chuku et al., 2023), who noted that aid conditions increase long-term debt exposure and reduce effectiveness of the domestic fiscal planning.

Political and institutional factors have also been found to play a key role in the debt sustainability. Campos et al. (2020) and Nizami et al. (2020) adopted the dynamic forecasting techniques such as fan charts to analyze the fiscal risks under uncertainty (Sokol, 2021). Their findings suggest that the macroeconomic volatility, inflation, and weak governance significantly impair a country's ability to manage debt (Campos et al., 2020). These conclusions are consistent with observations by the (Bowlsby et al., 2020; Husain, 2018), who highlighted how political instability and policy inconsistency deter the investment and disrupt long-term planning.

Literature further emphasizes importance of the revenue generation and expenditure efficiency in maintaining fiscal balance. Fuest and Riedel (2010) and Mascagni et al. (2014) stressed that the low tax compliance, narrow tax bases, and institutional weaknesses contribute to the chronic deficits in developing countries like Pakistan. (Safiullah et al., 2024; Mehrotra & Sergeyev, 2021) expanded this discussion by linking the unsustainable debt to broader the economic and social outcomes, such as environmental degradation and reduced developmental spending.

Lastly, recent studies such as Shah et al. (2024) and Ejaz and Hyder (2019) have tested the debt sustainability across different developing regions using panel data and structural models. Their findings reveal that while the fiscal consolidation and low interest rates may help in short term, long-run sustainability requires the deep institutional reforms, stable governance, and the effective public finance management (Agnello et al., 2013; Alvarado et al., 2004).

In summary, literature indicates that debt sustainability is a multidimensional issue shaped by the fiscal behavior, external dependency, institutional capacity, and macroeconomic conditions Okunola (2022). This study builds on these foundations by using a more integrated framework to examine how the public and external debt influence Pakistan's primary balance over a 50-year period, while also accounting for the structural breaks and political transitions.

# 3. METHODOLOGY

### 3.1. Theoretical Framework

Debt sustainability is commonly evaluated through the deterministic and stochastic frameworks. While deterministic models (e.g., bound testing) assess the long-term relationships between macroeconomic variables, they often fail to capture the policy-driven volatility. In contrast, stochastic and simulation-based models, such as those by (Abiad & Ostry, 2005; Afonso, 2005), allow for the endogenous fiscal responses under uncertainty. This study adopts a hybrid framework informed by Mahmood et al. (2009), combining the intertemporal budget constraints with accounting-based conditions and empirical estimation (Wilcox, 1989). The two key accounting conditions used in this study are:

1. **Necessary Condition:**

$$r^* < g \tag{1}$$

Where $r$ represents real interest rate on debt, $g$ represents real GDP per capita growth rate. If $r < g$, the debt-to-GDP ratio is expected to decline over the time, indicating sustainability.

2. **Sufficient Condition:**

$$S \geq 0 \qquad (2)$$

Where $S$ represents primary fiscal balance as a percentage of GDP. These indicators form the basis of debt sustainability tests applied across decades in Pakistan.

This study employs Two-Stage Least Squares (2SLS) estimation method to address the endogeneity in the relationship between debt indicators and primary balance (Mogstad et al., 2021). Endogeneity may arise from reverse causality or omitted variables, especially in the macroeconomic time series. The 2SLS approach ensures consistent estimation of coefficients by using lagged values of the external debt and the GDP deflator as instruments. This framework can also be interpreted as under in Table 1:

**Table 1:** DSA framework of Study on Public Debt, Annual Time series Data: 1973-2022

| Component | Approach/Details |
|---|---|
| **Objective** | Assess debt sustainability using empirical (2SLS) and accounting-based approaches |
| **Estimation Methods** | Traditional indicators, Accounting conditions ($r < g$, $PB \geq 0$), 2SLS econometric model |
| **Key Variables** | Public debt, external debt, primary balance, real interest rate, GDP deflator |
| **Data Sources** | WDI, IFS, Economic Survey of Pakistan, Cross-Country Fiscal Database |
| **Instrumental Variables (IVs)** | Lag of external debt, Lag of GDP deflator |
| **Period Covered** | 1973–2022 (annual time series) |

### 3.2. Data Description and Sources

Annual data from 1973 to 2022 was sourced from the World Development Indicators (WDI), IMF's International Financial Statistics (IFS), Economic Survey of Pakistan, and the Cross-Country Database of Fiscal Space. The key outcome variable is the primary balance, while public debt and external debt serve as main regressors. Control variables include real interest rates and GDP deflator. Data details are given in table 2.

**Table 2:** Summary of Variables

| Variable | Abbreviation | Unit | Description |
|---|---|---|---|
| Primary Balance | PB | % of GDP | Fiscal revenue minus non-interest expenditure |
| External Debt | ED | % of GDP | Total debt owed to non-residents |
| Public Debt | PD | Index (constructed) | Sum of domestic and external debt (exchange rate adjusted) |
| Real Interest Rate | RIR | Percentage | Inflation-adjusted interest rate |
| GDP Deflator | GDPD | Index | Measures price level changes in GDP |

**Note:** Public debt is constructed using Barro's (1979) approach, combining external debt (adjusted by exchange rate) and domestic debt. Data gaps from 1973 to 1990 were interpolated where necessary using cross-country series.

Descriptive statistics in table 3 reveal that Pakistan's primary balance averaged -4.23% of GDP, indicating persistent deficits. External debt remained around 32.5% of GDP on average, while public debt was more volatile, averaging 61.2%. The real interest rate fluctuated from -3.2% to 6%, reflecting mixed monetary policy regimes.

**Table 3:** Descriptive Statistics

| Variable | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|
| Primary Balance | –4.23 | 3.12 | –10.87 | 1.56 |
| External Debt | 32.45 | 7.34 | 18.23 | 45.87 |
| Public Debt | 61.22 | 14.52 | 34.89 | 87.43 |
| GDP Deflator | 92.43 | 23.11 | 45 | 142.01 |
| Real Int. Rate | 2.15 | 1.74 | –3.21 | 5.98 |

Note: Data sources include WDI, IFS, Handbook of Statistics, and author's calculations.

### 3.3. Empirical Strategy and Econometric Model

The paper uses the following model to investigate the hypothesis for debt sustainability. As shown below,

$$PB = f(ED, PD, GDPD, RIR) \quad (3)$$

Where, *PB* represents primary balance (% of GDP), *ED* represents external debt (% of GDP), *PD* represents public debt (constructed index), *GDPD* represents GDP deflator (index), and *RIR* represents real interest rate (%). This study uses a Two-Stage Least Squares (2SLS) approach shown in equation 4 and 5 to address potential endogeneity in the relationship between debt variables and the primary balance. Endogeneity may arise due to reverse causality or omitted variable bias, especially in time series settings where debt accumulation and macro indicators co-move (Koutsoyiannis, 1977).

Thus, we have the following expressions:

$$PB_t = \alpha_0 + \alpha_1 PD_t(\ln) + \alpha_2 ED_t + \alpha_3 RIR_t + \alpha_4 GDPD_t + \varepsilon_t \quad (4)$$

Where $ED_t$ and $GDPD_t$ are endogenous variables.

This paper uses the lags of the endogenous variables plugged into a normal fitted model. These lag variables are instrumented variables, used in the study. Thus, the final model will be:

$$PB_t = \alpha_0 + \alpha_1 PD_t(\ln) + \alpha_2 Z_{1t} + \alpha_3 RIR_t + \alpha_4 Z_{2t} + \varepsilon_t \quad (5)$$

Where $Z_{1t} = ED_{t-1}$ and $Z_{2t} = GDPD_{t-1}$

Instrumental Variables (for 2SLS) are $Z_{1t}$ representing lag of external debt and $Z_{2t}$ represents lag of GDP deflator. To address endogeneity, lagged value of $ED_t$ and $GDPD_t$ are used as instrument (Zahid et al., 2020).

### 3.4. Justification for Model Selection

The Durbin Wu Hausan test has been done to confirm the presence of endogeneity. As shown below:

**Table 4:** Durbin-Wu-Hausman Test

| Variable | OLS Coeff. | 2SLS Coeff. | Diff. |
|---|---|---|---|
| External Debt | -0.0006 | -0.0002 | -0.00033 |
| Public Debt | -1.032 | -2.055 | 1.023 |
| Real Interest Rate | -0.0216 | 0.032 | -0.053 |
| GDP Deflator | 0.0373 | 0.034 | 0.003 |
| Test Statistic | $\chi^2$= 73.80 | Prob. > $\chi^2$ | 0.0000 |

The Durbin-Wu-Hausman test in table 4 confirmed the presence of endogeneity, validating the use of 2SLS over OLS (Sheikhi et al., 2022). This approach is preferred over Ordinary Least Squares (OLS) due to its consistency and efficiency in the presence of endogenous regressors. A correlation matrix further supported the presence of multicollinearity and potential bias in simple regressions.

The correlation matrix (see Table 5) shows strong multicollinearity among the regressors and residuals, further supporting instrument-based estimation. To assess multicollinearity and the degree of association among variables, we present the correlation matrix below.

**Table 5:** Correlation Matrix

| Variable | PB | ED | PD | RIR | GDPD |
|---|---|---|---|---|---|
| Primary Balance (PB) | 1 | | | | |
| External Debt (ED) | –0.4746 | 1 | | | |
| Public Debt (PD) | –0.6807 | 0.8086 | 1 | | |
| Real Interest Rate (RIR) | –0.6882 | 0.62 | 0.9604 | 1 | |
| GDP Deflator (GDPD) | –0.5487 | 0.9492 | 0.9232 | 0.7925 | 1 |

The matrix in table 5 depicts, that external debt and GDP deflator are highly correlated with residuals listed in the last column causing the issue of endogeneity. Moreover, primary balance moderately correlated with external debt, public debt, GDP deflator and real interest rate while we can see that external debt is highly correlated with GDP deflator. In brief there are more chances for occurrence of endogeneity caused by these endogenous variables.

## 4. ANALYSIS AND RESULTS

For unit root testing the Augmented Dickey Fuller (ADF) test has been employed. All variables appear stationary (Results are given in Appendix A). This section presents the regression output using the Two-Stage Least Squares (2SLS) estimation technique (Table 6), selected to address endogeneity concerns between debt variables and Pakistan's primary balance. Lagged values of external debt and the GDP deflator were used as instruments.

**Table 6:** 2SLS Regression Estimates

| Variables | Coefficient | Std. Error | z | P > t | [95% Confidence Interval] |
|---|---|---|---|---|---|
| External Debt | -0.0006 | 0.0007 | -0.83 | 0.408 | -0.0019 to 0.0008 |
| Public Debt (ln) | -1.0320 | 2.1986 | -0.47 | 0.639 | -5.3412 to 3.2772 |
| Real Interest Rate | -0.0216 | 0.1186 | -0.18 | 0.856 | -0.2540 to 0.2109 |
| GDP Deflator | 0.0374* | 0.0200 | 1.87 | 0.062 | -0.0019 to 0.0764 |
| Constant | 7.7493 | 25.3997 | 0.31 | 0.76 | -42.033 to 57.532 |
| Number of Obs. | 49 | | Prob > $\chi^2$ | | 0.0000 |
| Wald $\chi^2$ (4) | 44.00 | | R-squared | | 0.4704 |

### 4.1. 2SLS Results Discussion

Table 6 displays the 2SLS results. Public debt has a negative but statistically insignificant impact on the primary balance, with a coefficient of –1.03 (p = 0.639), while external debt's effect is similarly insignificant (p = 0.408). Among the control variables, only the GDP deflator approaches significance (p = 0.062), suggesting that inflation may affect fiscal performance. The real interest rate shows no significant impact. The model explains approximately 47% of the variation in the dependent variable ($R^2$ = 0.4704), indicating a moderate fit.

These findings support the previous literature (e.g., Awan et al., 2011; Mahmood et al., 2014), which also reported the weak or inconsistent fiscal responses to rising debt levels in the Pakistan. Results underscore the limited explanatory power of debt variables alone and highlight need to account for the broader structural and institutional factors.

Regression results suggest that neither public nor external debt significantly predicts the Pakistan's primary balance in long run. This may be due to country's historically weak fiscal institutions, inconsistent tax policies, and the politically driven expenditure patterns (Fuest & Riedel, 2010; Mascagni et al., 2014). Moderate explanatory power of the model reinforces that debt sustainability is

not solely a function of the debt stock variables but is shaped by the structural governance challenges and macroeconomic instability (Chandia et al,, 2013). In light of these findings, achieving debt sustainability will require more than managing the debt levels. It demands improving public financial management, enhancing the institutional efficiency, and building fiscal buffers against the external shocks (Willems & Zettelmeyer, 2022).

### 4.2. Structural Break Analysis and Historical Context

To contextualize regression outcomes, the study incorporates structural break tests that identify the significant fiscal disruptions over the sample period (Ydstie, 2011). Breakpoints were detected in primary balance (2005), public debt (1985), external debt (2010), GDP deflator (2009), and the real interest rate (2007). These shifts correspond to the critical events such as increased defense spending, energy subsidies, major floods, global financial crises, and the policy tightening (Colander et al., 2009).

For instance, the 2005 break in the primary balance aligns with rising subsidies and stagnant revenue mobilization. Similarly, the 2010 surge in external debt reflects trade deficits and post-disaster borrowing, while the 2009 shift in price levels corresponds to the inflationary aftermath of the global crisis. These episodes emphasize how macroeconomic volatility and policy shocks affect debt sustainability beyond linear regression outcomes (Hetzel, 2024).

### 4.3. Addressing Research Questions

Central research question guiding this study is: To what extent do public and external debt influence the Pakistan's primary fiscal balance, and what do these relationships imply about sustainability of the country's debt from 1973 to 2022? This question aims to evaluate both the *short-run fiscal responsiveness* to the debt accumulation and *long-run sustainability* of the fiscal policies using empirical econometric tools and theoretical benchmarks. Through a Two-Stage Least Squares (2SLS) regression framework and debt sustainability conditions (i.e., $r < g$ and primary surplus $\geq 0$). The study further explored, whether debt management has been aligned with the responsible fiscal behavior (Khan, 2016). The results suggest that neither public nor external debt significantly determines primary balance in Pakistan. Instead, fiscal position appears to be shaped by the structural inefficiencies (like weak tax systems and poor public finance management), macroeconomic shocks (such as inflation, natural disasters, and security costs), and the policy inconsistency (due to political instability). Moderate R-squared value of 0.4704 confirms that these debt-related variables explain almost half of the variation in Pakistan's primary balance, highlighting that while debt matters, broader systemic reforms are crucial for achieving the long-term debt sustainability.

### 4.4. Debt Sustainability Issues

Although the regression results show no significant direct impact of public and external debt on Pakistan's primary balance, they uncover deeper structural issues affecting debt sustainability. Persistent fiscal deficits, weak tax administration, and inefficient public spending exacerbated by political instability and policy inconsistency have eroded fiscal discipline. External shocks such as oil price volatility and natural disasters have further increased borrowing needs, exposing the economy to financial risks. Structural weaknesses like a stagnant tax-to-GDP ratio and widespread tax evasion limit the government's fiscal capacity. Applying the accounting-based criteria ($r^* < g$ and primary balance $\geq 0$), only the periods 1973–82 and 1993–2002 are found to be sustainable, underscoring that Pakistan's debt challenges stem from long-standing governance failures, institutional weaknesses, and vulnerability to both domestic and external shocks.

### 4.5. Debt Sustainability Trend Analysis

Figure 1 illustrates trajectory of the real interest rate and the GDP growth rate over the time. Periods when real interest rates exceeded the growth rates are marked as fiscally unsustainable. For instance, during the 1984–91 and 2006 onwards, $r > g$, indicating debt accumulation without the growth support. This violates necessary condition for the sustainability (Mahmood et al., 2009).

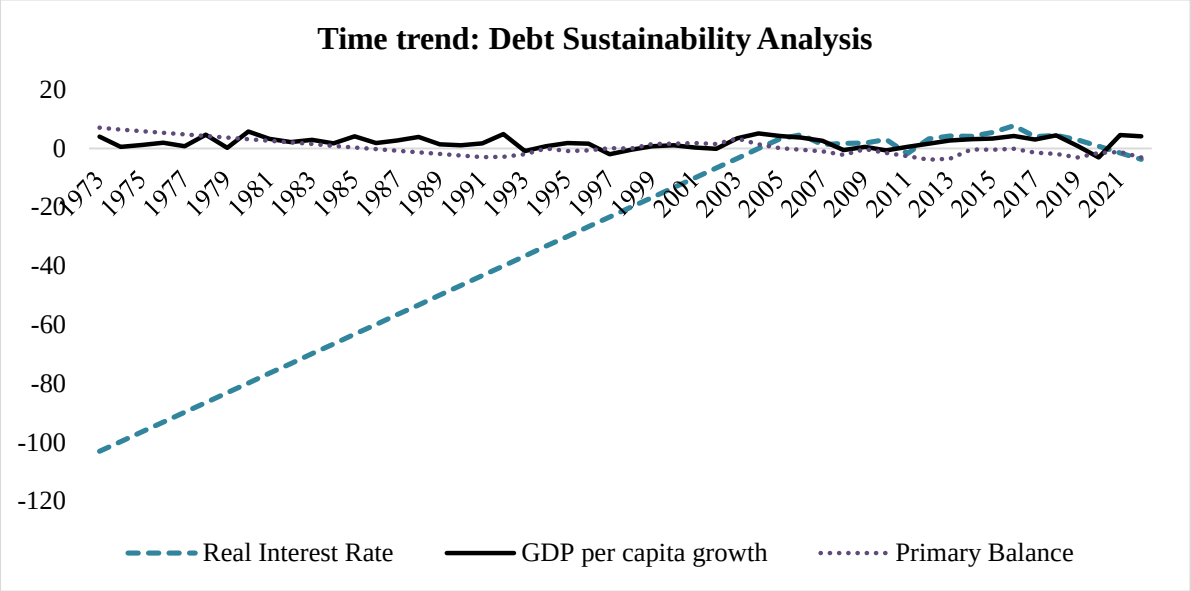


**Figure 1:** Real Interest Rate vs. GDP Growth Rate (1973–2022)

### 4.6. Debt Sustainability Test Using Accounting Approach

Pakistan's debt sustainability from table 7 has remained largely elusive over past five decades, with the only two decades 1973–82 and 1993–2002 meeting both necessary ($r < g$) and sufficient (primary balance ≥ 0) conditions. This persistent failure reflects the deep-rooted structural weaknesses in the fiscal management, including poor revenue mobilization, excessive reliance on the external borrowing, and policy instability (Bandiera & Tsiropoulos, 2020; Khan et al., 2020). Historical factors such as nationalization, political transitions, and the external shocks further compounded problem, while repeated IMF programs in 1980s and 2000s yielded the limited long-term gains. Despite occasional reforms, ongoing challenges like low tax-to-GDP ratios, corruption, and the inefficient spending continue to undermine fiscal resilience. Sustainable debt management in Pakistan will require the consistent fiscal discipline, institutional strengthening, and the reduced external dependency. Historically, Pakistan's debt burden stems from its early dependence on external borrowing post-independence to fund development, which was not accompanied by effective debt oversight (Voeten, 2013).

**Table 7:** Decade-wise Debt Sustainability Assessment

| Years | $r^*$ | g | PB | $r^* < g$ | PB ≥ 0 | Conclusion |
|---|---|---|---|---|---|---|
| 1973-82 | -88.10 | 2.49 | 4.56 | Yes | Yes | Unsustainable |
| 1983-92 | -54.85 | 2.65 | -0.92 | Yes | No | Unsustainable |
| 1993-02 | -21.60 | 0.35 | 0.36 | Yes | Yes | Sustainable |
| 2003-12 | 1.45 | 2.09 | -0.65 | Yes | No | Unsustainable |
| 2013-22 | 2.88 | 2.79 | -1.61 | No | No | Unsustainable |

Structural break analysis highlighted how major economic disruptions influenced the Pakistan's fiscal indicators: primary balance broke in 2005 due to the rising defense expenditures, energy subsidies, and a weak tax mobilization; public debt spiked in 1985 amid large fiscal deficits and the exchange rate depreciation; external debt surged in 2010 due to the trade imbalances, floods, and instability; GDP deflator shifted in 2009 following the global financial crisis and domestic inflation (Javed et al., 2021) and real interest rates adjusted in the 2007 due to inflationary pressure and policy changes. These breaks underscore the Pakistan's fiscal fragility. Summarizing the section by integrating both the econometric and accounting approaches, it affirms only partial empirical support for debt sustainability, with sustainability observed in the isolated decades but an overall trend of the persistent fiscal vulnerability.

# 5. CONCLUSION AND POLICY IMPLICATIONS

This study examined Pakistan's debt sustainability by assessing the impact of public and external debt on the primary fiscal balance from 1973 to 2022, using a break-adjusted 2SLS estimation approach and accounting-based debt sustainability tests. The results indicate that neither public nor external debt significantly affects the primary balance, suggesting that debt sustainability in Pakistan is influenced less by debt stock variables and more by structural weaknesses such as fiscal mismanagement, limited tax capacity, and political instability.

The structural break analysis confirmed that external shocks, such as the 2008 financial crisis and 2010 floods, alongside policy inconsistencies, have contributed to persistent fiscal vulnerability. Accounting-based conditions (i.e., $r < g$ and primary balance $\geq 0$) were met only in two decades 1973–82 and 1993–2002 highlighting that sustainable debt management in Pakistan has been the exception, not the norm.

To enhance debt sustainability, policymakers should implement broad-based fiscal reforms by expanding the tax base, improving compliance, and rationalizing subsidies. Strengthening institutions through greater transparency, fiscal discipline, and improved public finance management is equally vital. A prudent debt strategy that minimizes reliance on short-term and foreign-currency borrowing can reduce exposure to external risks, while building fiscal buffers and adopting counter-cyclical spending policies will improve the country's resilience to economic shocks. While the study captures long-term trends, it does not model potential future debt trajectories under different macroeconomic scenarios (e.g., fan charts or probabilistic simulations). Also, some historical data (pre-1990) were interpolated, which may affect precision. Future studies should integrate political economy variables, can simulate policy shocks, and explore regional comparisons across similar developing economies. Incorporating dynamic panel models or machine learning-based fiscal risk assessments may also enrich the analysis.

**Acknowledgment**
The author gratefully acknowledges the constructive feedback provided by the anonymous reviewers and the editorial team of the Kashmir Economic Review.

**Funding Source:**
This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors

**Conflict of Interests:**
The authors have declared that no competing interests exist.

## REFERENCES

Abiad, M.A., Ostry, M.J.D., 2005. *Primary Surpluses and Sustainable Debt Levels in Emerging Market Countries*. International Monetary Fund.

Afonso, A. (2005). Fiscal sustainability: The unpleasant European case. *FinanzArchiv/Public Finance Analysis*, 19-44.

Agnello, L., & Sousa, R. M. J. B. o. E. R. (2013). Fiscal policy and asset prices. *Bulletin of Economic Research* 65(2), 154-177.

Alvarado, C. D., Izquierdo, A., & Panizza, U. (2004). *Fiscal Sustainability in Emerging Market Countries with an Application to Ecuador*, Working Paper No. 511, Inter-American Development Bank (IDB).

Ampofo, G. M. K., Jinhua, C., Bosah, P. C., Ayimadu, E. T., & Senadzo, P. J. R. P. (2021). Nexus between total natural resource rents and public debt in resource-rich countries: A panel data analysis. *Resources Policy*, *74*, 102276.

Anwer, T. (2000). *Unsustainable Debt Burden and Poverty in Pakistan:* A Case for Enhanced HIPC Debt Relief *(No. 2002/53)*. WIDER Discussion Paper. Helsinki: United Nations University.

Awan, A., Asghar, N., & Rehman, H. U. (2011). The impact of exchange rate, fiscal deficit and terms of trade on external debt of Pakistan. *Australian Journal of Business and Management Research*, 1(3), 10.

Bandiera, L., & Tsiropoulos, V. (2020). A framework to assess debt sustainability under the Belt and Road Initiative. *Journal of Development Economics*, 146, 102495.

Barro, R. J. (1979). On the determination of the public debt. *Journal of Political Economy*, 87(5), 940-971.

Bird, G. (2007). The IMF: A bird's eye view of its role and operations. *Journal of Economic Surveys*, 21(4), 683-745.

Bohn, H. (2008). The sustainability of fiscal policy in the United States. *Sustainability of Public Debt*, 15, 15-50.

Bohn, H. (1998). The behavior of US public debt and deficits. *Quarterly Journal of Economics*, 113(3), 949-963.

Bond, P. (2020). BRICS banking and the demise of alternatives to the IMF and World Bank. *International Development Assistance and the BRICS*, 189-218.

Bowlsby, D., Chenoweth, E., Hendrix, C., & Moyer, J. D. (2020). The future is a moving target: predicting political instability. *British Journal of Political Science*, 50(4), 1405-1417.

Bresser-Pereira, L. C. (2022). A turning point in the debt crisis: Brazil, the US Treasury and the World Bank. *Brazilian Journal of Political Economy*, 19, 350-380.

Campos, V. L., Marín, K. L., & Badilla, C. M. (2020). *Primary Balance: Sustainability Analysis Under Uncertainty*. IDB Working Paper Series, No. IDB-WP-1151, Inter-American Development Bank (IDB), Washington, DC,

Cecchetti, S. G., Mohanty, M. S., & Zampolli, F. (2010). *The Future of Public Debt: Prospects and Implications*. BIS Working Paper (No. 300), Bank for International Settlements.

Chandia, K. E., Javid, A. Y. J. P. E., & Finance. (2013). An analysis of debt sustainability in the economy of Pakistan. *Journal of Public Economics and Finance*, 5(1), 133-142.

Chuku, C., Samal, P., Saito, J., Hakura, D., Hakura, M. D. S., Chamon, M., ... & Zettelmeyer, M. J. (2023). Are we heading for another debt crisis in low-income countries? Debt vulnerabilities: Today vs the pre-HIPC era. International Monetary Fund.

Colander, D., Goldberg, M., Haas, A., Juselius, K., Kirman, A., Lux, T., & Sloth, B. J. C. R. (2009). The financial crisis and the systemic failure of the economics profession. *Critical Review* 21(2-3), 249-267.

Conway, P. J. (2006). The International Monetary Fund in a time of crisis: A review of Stanley Fischer's IMF essays from a time of crisis: The international financial system, stabilization, and development. *Journal of Economic Literature*, 44(1), 115-144.

Ejaz, M., & Hyder, K. (2019). A fan chart approach to debt sustainability in Pakistan. *Lahore Journal of Economics*, 24(2), 1-23.

Fatemah, A., & Haq, A. ul. (2024). Targeting debt in Pakistan: A structural macro-econometric model. *IRASD Journal of Economics*, 6(2), 285–312.

Forgha, N. G., Mbella, M. E., & Ngangnchi, F. H. (2014). External debt, domestic investment and economic growth in Cameroon: A system estimation approach. *Journal of Economics Bibliography*, 1(1), 3-16.

Fuest, C., & Riedel, N. (2010). *Tax Evasion and Tax Avoidance in Developing Countries: The Role of International Profit Shifting*, Working Papers 1012, Oxford University Centre for Business Taxation.

Ghosh, A. R., Kim, J. I., Mendoza, E. G., Ostry, J. D., & Qureshi, M. S. (2011). Fiscal Fatigue, Fiscal Space and Debt Sustainability in Advanced Economies. Working Paper 16782, National Bureau of Economic Research, Cambridge.

Hetzel, R. (2024). What the Fed needs to do to control inflation and stabilize the economy. *Annals of Computational Economics*.

Husain, I. (2018). Pakistan's economy and regional challenges. *International Studies*, 55(3), 253-270.

Hussain, A., & Idrees, A. S. (2019). Fiscal performance and external public debt sustainability: A case study of Pakistan. *Review of Economics and Development Studies*, 5(4), 142-149.

Hussain, A., Idrees, A. S. J. J. o. E., & Development, S. (2015). Fiscal Performance and External Public Debt Sustainability: A Case Study of Pakistan. *Journal of Economics and Sustainable Development*, 6(7), 1-9.

Javed, S. A., Shaukat, B., & Ahmad, I. (2021). How the Global and Gulf Financial Crises Affected Pakistan: Ten-year Review. *International Migration*, 59(5), 19-37.

Khan, H. R. (2016). *Public Debt Management: Reflections on Strategy and Structure*, Springer.

Khan, Z., Changgang, G., Afzaal, M., Ahmad, R., & Aron Issack, S. (2020). Debunking criticism on the China-Pakistan economic corridor. *The Chinese Economy*, 53(6), 477-487.

Koutsoyiannis, A. (1977). *Theory of Econometrics*, 2nd edition, Macmillan. In: London.

Lesage, D., Debaere, P., Dierckx, S., Vermeiren, M.J.I.P. (2013). IMF Reform After the Crisis. *International Politics*, 50(4), 553-578.

Mahmood, T., Arby, M. F., & Sherazi, H. (2014). Debt sustainability: A comparative analysis of SAARC countries. *Pakistan Economic and Social Review*, 15-34.

Mahmood, T., Rauf, S.A., & Ahmad, H.K.J.P.E. (2009). Public and external debt sustainability in Pakistan (1970s—2000s). *Pakistan Economic and Social Review*, 47(2), 243-267.

Mascagni, G., Moore, M., & McCluskey, R. (2014). *Tax Revenue Mobilisation in Developing Countries: Issues and Challenges*. European Union (Belgium).

Mehrotra, N. R., & Sergeyev, D. (2021). Debt sustainability in a low interest rate world. *Journal of Monetary Economics*, 124, 1-18.

Mendoza, E. G., & Ostry, J. D. (2008). International evidence on fiscal solvency: Is fiscal policy responsible? *Journal of Monetary Economics*, 55(6), 1081-1093.

Modigliani, F. (1961). Long-run implications of alternative fiscal policies and the burden of the national debt. *The Economic Journal*, 71(284), 730-755.

Mogstad, M., Torgovitsky, A., & Walters, C. R. (2021). The causal interpretation of two-stage least squares with multiple instrumental variables. *American Economic Review*, 111(11), 3663-3698.

Nizami, M. I., Ihsan, H., & Hasan, H. (2020). Debt Sustainability Analysis in Pakistan: A Fan Chart Approach. *Pakistan Economic Review*, 3(1), 1-23.

Okunola, B. P. (2022). *Determinants of Sectoral Capital Inflows in Nigeria*. MSc thesis, Department of Economics and Development Studies, Faculty of Management and Social Sciences. Lead City University. Ibadan, Oyo State, Nigeria.

Ormaechea, M. S. A., & Martinez, M. L. (2021). *A Guide and Tool for Projecting Public Debt and Fiscal Adjustment Paths with Local-and Foreign-Currency Debt*, International Monetary Fund.

Roubini, N. (2001). *Debt Sustainability: How to Assess Whether a Country is Insolvent*. Stern School of Business, New York University.

Safiullah, M., Houqe, M. N., Ali, M. J., & Azam, M. S. (2024). Debt overhang and carbon emissions. *International Journal of Managerial Finance*, 20(4), 1069-1093.

Shah, S. S. A., Rafique, R., & Afridi, M. A. (2024). Empirical examination of public debt sustainability in African economies: A panel data analysis. *Journal of Public Affairs*, 24(1), e2896.

Sheikhi, A., Bahador, F., & Arashi, M. (2022). On a generalization of the test of endogeneity in a two stage least squares estimation. *Journal of Applied Statistics*, 49(3), 709-721.

Sokol, A. (2021). *Fan Charts 2.0: Flexible Forecast Distributions with Expert Judgement*. ECB Working Paper No. 2624, European Central Bank.

Voeten, E. (2013). *Data and Analyses of Voting in the UN General Assembly*. Routledge handbook of international organization, 54-66.

Wilcox, D. W. (1989). The sustainability of government deficits: Implications of the present-value borrowing constraint. *Journal of Money, Credit and Banking*, 21(3), 291-306.

Willems, T., & Zettelmeyer, J. (2022). Sovereign debt sustainability and central bank credibility. *Annual Review of Financial Economics*, 14(1), 75-93.

Ydstie, J. J. N. P. R. (2011). Does The Economy Need A Little Inflation? *American Economic Association, Papers and Proceedings*, 101(3), 307-310.

Zahid, M., Rahman, H. U., Khan, M., Ali, W., & Shad, F. (2020). Addressing endogeneity by proposing novel instrumental variables in the nexus of sustainability reporting and firm financial performance: A step-by-step procedure for non-experts. *Business Strategy and the Environment*, 29(8), 3086-3103.

**Appendix A:** Results of the Unit Root Test (Augmented Dickey-Fuller test)

| **Variables** | **Test Statistic Z(t)** | **p-value for Z(t)** | **Number of obs** |
|---|---|---|---|
| Primary balance | -2.207 | 0.2038 | 45 |
| Real interest rate | -1.988 | 0.2920 | 45 |
| External debt | 3.601 | 1.0000 | 45 |
| GDP deflator | 3.653 | 1.0000 | 45 |
| Public debt | 4.647 | 1.0000 | 45 |

All the indicators show that the series is stationary throughout the given time range. P value is greater than 0.05 indicating rejection of null hypothesis i.e., series has a unit root.