

# Can Pakistan Raise More External Debt? A Fiscal Reaction Approach

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## Abstract

This study has assessed the role of existing policies in determining the state of debt sustainability for the Pakistan economy (1980- June 2019) through fiscal reaction function. This study adds to the literature in two aspects. First, a policy index has been constructed to formulate a debt-policy interactive term that implies whether or not existing macroeconomic policies contribute in making external debt sustainable in Pakistan. Second, this study has gauged the potential sustainable external debt through in-sample forecast method. The estimated results obtained by the ARDL method show that Pakistan has just entered into a phase of unsustainable debt burden in the long run as fiscal reaction analysis exhibits the weak significant negative relationship between primary balance and external debt to GDP ratio. Moreover, existing macroeconomic policies also show a negative association with the primary balance that implies the ineffectiveness of policies in making external debt sustainable for Pakistan. This study suggests that an increase in foreign inflows through remittances or export earnings may improve the debt sustainability state in Pakistan.

**Keywords:** External debt sustainability, fiscal reaction function, Autoregressive distributed lag model, macroeconomic policies, primary balance.

**JEL Classification Number:** F34, O11, O19

## 1. Introduction

Endogenous growth literature has highlighted the scarcity of financial resources concerning sustainable growth. These theories have emphasized on optimal utilization of financial and psychical capital that are essential for economic growth and initiated a debate overutilization of limited financial resources and their spillovers in the long run (King, Plosser & Rebelo, 1988). However, the formal role of foreign capital inflows underlined by Chenery and Strout (1966) has directed literature to

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### ARTICLE HISTORY

21 May, 2019 Submission Received

23 Aug, 2019 First Review

05 Feb, 2020 Second Review

25 Mar, 2020 Accepted

explore existing gaps in the economy. According to Chenery and Strout (1966), every developing country faces two interlinked gaps. Existence of first gap *saving-investment* leads to the second gap *import-export*. To overcome the saving-investment gap, developing countries seek foreign aid or external debt because raising domestic debt can cause more harm than good as domestic debt may crowd out private investment that further widens the saving-investment gap (Abbas & Wizarat, 2018; Mansoor, 2018). The rationale behind foreign capital inflows is that theses, in the form of aid and external debt, can overcome *funds deficiency trap* and boost investment to attain economic growth. However, the role of macroeconomic policies may not be overlooked (Mansoor & Ullah, 2019).

A look at the external debt progression of Pakistan reveals that it has become more than double during the last decades. For example, In June 2009, the external debt was USD 51.1 billion that has soared up to USD 106 billion in June 2019 (Hereafter 2019). Although the size of external debt has become more than doubled, yet it has been almost the same as a percentage of GDP during the last ten years (i.e. around 33 % of GDP). A review of the literature reveals that most of the developing countries have accumulated external debt in a bit to reduce their primary or trade deficits (Buiter, 1983; Alt & Lassen 2006; Buti, Martins, & Turrini, 2007). However, the situation turns complex when a country faces no change in debt repayment capacity that is subject to export earnings and other foreign inflows like remittances and foreign direct investment. Therefore, smooth repayment of debt relies on the utilization of raised external debt; this non-productive use or non-revenue generating consumption of debt may lead to a debt crisis. Further, external borrowing does not harm an economy if the primary balance remains stable (Osinubi, Dauda, & Olaleru, 2006; Alam & Taib, 2013; Saima & Uddin, 2017). Literature has highlighted different determinants of external debt sustainability. Broadly, the external debt is said to be sustainable if a country can repay its current and future liabilities without compromising future economic growth.

An ample amount of literature has assessed external debt sustainability through different approaches. Generally, literature has employed three empirical approaches namely: Fiscal reaction function (FRF), debt indicator (DI) and Critical Interest rate (CIR). This study uses the FRF approach for debt sustainability analysis for Pakistan due to its significance highlighted by Bohn, (1995), Bohn (1998), Gali, Perotti, Lane, and Richter (2003) and de Mello, (2005). They suggest that the FRF approach is an extensive method to assess debt sustainability because this approach implies that external debt is sustainable if an increase in debt to GDP ratio has a positive impact on the fiscal deficit (contract) and GDP. In addition, Khalid et al (2007), Turrini (2008) and Afonso and Hauptmeier (2009) have also recommended this approach for empirical

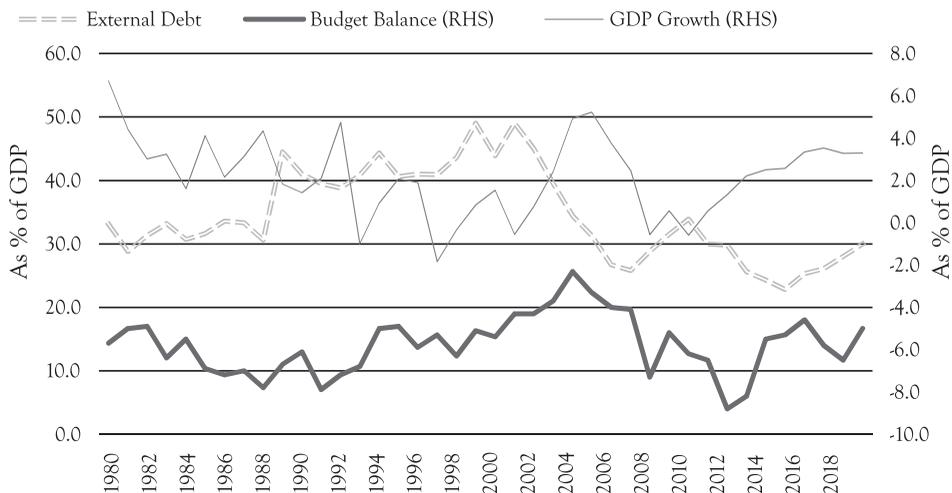
assessment as the other two approaches have few drawbacks. For instance, the DI method provides a comparison of different debt burden indicators to their threshold levels, the results vary with reference to change in indicators used. DI approach implies that debt unsustainability arises if a debt-burden indicator exceeds its indicative threshold. Historically, Tahir et al (1998) and Chaudhary and Anwar (2000) have maintained debt to be weakly sustainable for Pakistan by DI approach but Chowdhury (2001) found a negative impact of external debt on Pakistan's economic growth. He also found that external debt was unsustainable using a different debt indicator for the same period of analysis. Similarly, Abdelhadi (2013) and Al-Refai (2015) suggest different results for debt sustainability in the case of Jordan using different debt indicators through the DI approach for the same period of inquiry. Similarly, literature has highlighted a few drawbacks of the CIR approach as empirical results obtain through CIR, for policy implications, may vary under different regimes of monetary policy (Wood & Rottman, 1970; Buitier, 2003; Menz & Vachon, 2006; Feld & Kirchgässner, 2008). CIR approach suggests that if the average interest rate on external loans exceeds the CIR, debt will increase faster than absolute GDP and results in a debt trap, whereas the low value of CIR indicates that country is able to maintain its current Debt-GDP ratio over time and can meet future interest payments on new loans. Further, interest rate fluctuations in the domestic economy may affect private investment so as to fall in the production of exportable commodities, a decrease in export earnings may result in low repayment capacity of a country. Therefore, results obtained through the CIR approach may vary with reference to monetary policy targets, the difference between domestic and foreign interest rates and exchange rate fluctuations (Makin, 2005; Adegbite, Ayadi, & Ayadi, 2008, Taylor, Proano, de Carvalho, & Barbosa, 2012).

This study has assessed external debt sustainability for Pakistan's economy through the FRF approach (1980-2019). Furthermore, this study has overcome the existing gap in the literature by considering the role of macroeconomic policies in the determination of the state of debt sustainability because literature has maintained a strong role of policies in shaping the long-run growth and repayment capacity of future obligations of the economy. In addition, we have analyzed the threshold level of external debt for long run sustainability by using in-sample forecast method.

The organization of this study is as follows: stylized facts on the external debt of Pakistan with reference to country specific literature has presented in part II. Part III has presented a brief review of existing literature on determinants of debt sustainability. Part IV is about the methodology used while the last section discussed results and policy implications.

## 2. Stylized Facts on External Debt of Pakistan

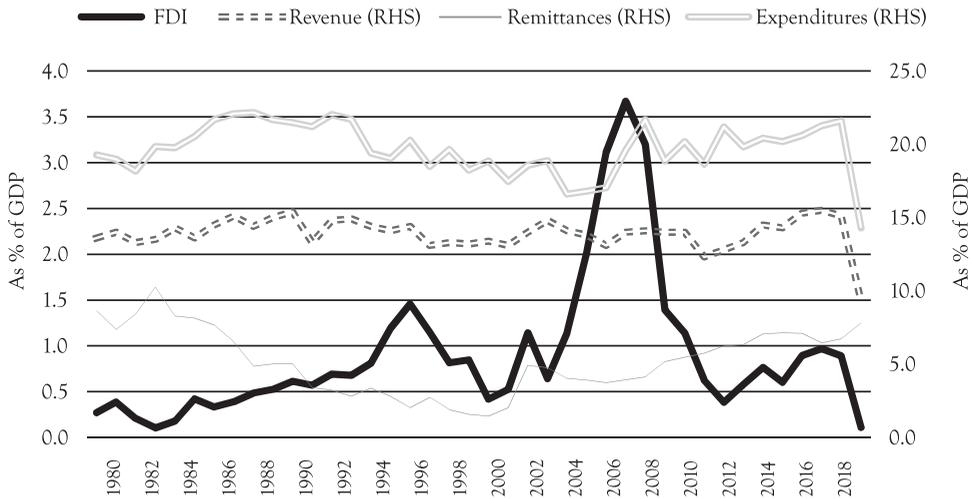
The Existing literature on debt-growth dynamics and debt sustainability is largely inconclusive. The variation in results is mainly on account of three reasons. Firstly, countries that accumulate external debt to finance fiscal deficit along with stable foreign inflows and export earnings tend to have better repayment capacity and low probability of debt crisis (Singer, 1990; Eaton, 1993). However, Pakistan does not completely fall in that category, as literature presents mixed results regarding the nature of the relationship among external debt, exports potential and economic growth of Pakistan in the long run. For instance, Kemal (2001), Sharif et al., (2009) and Atique and Malik, (2012) suggest a negative link of external debt with fiscal balance, inflation, development expenditures, export enhancement, saving rate and economic growth of Pakistan. According to them, debt sustainability has always been a problem for Pakistan. However, Zakaria, (2012) and Zaman and Arsalan, (2014) maintained short-term positive effects of debt on economy and suggest long run debt sustainability. Historically, debt repayment capacity has remained low due to low exports earning and inconsistent foreign inflows in Pakistan. Figure (1) indicates the situation of foreign debt accumulation to finance primary deficit of Pakistan and debt sustainability indicators. Debating over debt dynamics of 1980s and 1990s, the data shows external debt stock of the country spiked up and became more than double from 1980s (US\$ 9.5 billion) to 1990s (US\$ 19 billion).



Source: Ministry of Finance and State Bank of Pakistan

**Figure 1:** External Debt Sustainability of Pakistan

Notably, consistently low FDI and sharp decline in remittances to GDP ratio reduced repayment capacity that resulted in debt trap of 1990s (See, Figure 2). However, current expenditures remained high throughout the decades with barely any improvement in exports earning to GDP ratio. However, Pakistan achieved a fine growth rate during 1980s; the primary balance remained negative despite of foreign inflows. In 1990s, Pakistan’s exports could not increase much even after devaluation of currency and economy experienced debt trap in addition to trade sanctions due to nuclear tests. From 2013 to 2017, Pakistan debt burden show improvement and become sustainable as economic growth rate, FDI and remittances inflows showed significant improvement. Unfortunately, debt sustainability indicators present another start of a phase of unsustainability or debt trap. Figures (1 and 2) clearly reflect a sharp decline in foreign inflows and primary balance with surging external debt to GDP ratio after 2017.



Source: Ministry of Finance and State Bank of Pakistan

**Figure 2:** Determinants of External Debt Sustainability of Pakistan

Secondly, literature suggest that countries experiencing political instability (military coup, internal or external conflicts etc.) suffers with fund leakages to manage political and other conflicts by seeking more loans. But, these inflows of debt do not necessarily make their ways to finance the twin deficits and as a result, GDP growth may remain stagnant (Vandeveld, 1997; Wolde-Rufael, 2009; Husain, 2009; Qureshi, Ali, & Khan, 2010). Further, such countries face repayment capacity problem and reduction in private investment due to law and order situation that reduces real GDP, tax collections and export earnings (Khan & Ahmed, 2007; Ahmed, 2012; Arezki & Brückner, 2012). Somehow, this line of literature is relevant to Pakistan but results are different. Since birth, Pakistan has witnessed four military regimes and data shows

that debt sustainability, primary balance, tax collections and foreign inflows increased during military regimes. One justification can be that during period of conflict, Pakistan received foreign aid, grants and debts to combat intra and inter-state conflict, these inflows of funds helped in financing twin deficits and interest payments of external loans (Ali & Mustafa, 2012; Farid, 2017; Mansoor & Ullah, 2019).

Third line of literature suggests that debt sustainability is subject to existing macroeconomic policies also. Countries that experience decline in public investment due to increase in domestic sales tax and interest rate witness reduction in export production, high rate of inflation, fall in foreign investment, and low industrialization due to higher cost of borrowing. It also contributes to unemployment and low productivity. Thus, these dynamics of fiscal and monetary policies determine state of debt sustainability (Burnside & Dollar, 2000; Akçay, Alper, & Özmucur 2001; Alberola, Montero, Braun, & Cordella, 2006; Escolano, 2010). Similarly, crowding out due to public borrowing widen aggregate demand-supply gap so government import more, difficulty in debt servicing due to low tax collection leads to further rise in external debt to repay previous debt (Cohen, 1993; Cunningham, 1993; Fosu, 1999). Reviewing the data, Pakistan has experienced debt sustainability problems during times of high inflation, contractionary monetary policy regimes and primary deficit financing borrowing. Wizarat (1997) identified that debt becomes unsustainability in Pakistan whenever government finances current deficit through loans and ignores the positive impact of investment in social development plans. In addition, the study claims that vested interests influenced domestic policies and were the reason behind unmanageable debt situations. Pakistan often approaches International Monetary (IMF) for financial support by surrendering her economic sovereignty by accepting the structural adjustment program of IMF. During 2000s, Pakistan was given debt relief and its external debt stock of US\$ 11.5 billion was rescheduled that was supposed to be repaid to Paris club Credit in 2002. This relief helped economy in the short term; an average GDP growth rate of almost 5 %, fiscal and current account deficit declined but frequent changes in policy instruments exposed the economy to another debt trap in late 2000s. From 2007 to 2011, economy experienced an increase in external debt to foreign exchange earnings (FEE) ratio (from 122% to 144%) and external debt to foreign exchange reserves ratio (FER) from 3% to 4.4%<sup>4</sup>. Recently, considerable surge in the country's external debt has again ignited apprehensions regarding sustainability of country's external debt stock in the medium to long-term. Table (1) presents details of solvency and liquidity state of Pakistan's external debt. External debt-to-GDP ratio indicates solvency check and specifies debt-bearing capacity, whereas external debt servicing to foreign exchange earnings ratio as liquidity approach which shows the country's debt servicing capacity.

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4 Different reports of Pakistan Economic Survey (from 2008-09 to 2012-13).

**Table 1:** Solvency and Liquidity Indicators

External Debt Sustainability Indicators	2011	2012	2013	2014	2015	2016	2017	2018
External Debt / Foreign Exchange Earnings	1.2	1.1	1.0	1.0	1.0	1.1	1.2	1.3
External Debt / Foreign Exchange Reserves	3.0	3.5	4.4	3.6	2.7	2.5	2.9	4.3
External Debt / GDP (%)	25.9	23.7	20.8	21.0	18.8	20.7	20.5	22.3
External Debt Servicing / Foreign Exchange Earnings (%)	6.3	7.4	11.1	11.7	8.5	8.5	12.4	10.8

Source: Debt Policy Coordination Office, Ministry of Finance

Assessing 2011 to 2017, the volume of external debt has decreased in relation to foreign exchange reserves indicating foreign exchange reserves consolidation and overall improvement in Pakistan's repayment capacity. While reasonable reduction in foreign exchange reserves in terms of increase in current account deficit over the last few years led to deterioration in this ratio. It is pertinent to consider that increase in current account deficit was mainly because of increase in imports of industrial raw material, machinery related to CPEC and petroleum products. However, there was no point of concern as current account was expanding due to significant investment in capital stock. However, declined in investment with rise in domestic interest rate, a decline in foreign reserves and remittances in FY 2019 refer to rise of another unmanageable debt trap.

### 3. Brief Review of Related Literature

Recalling the existing theoretical literature of debt sustainability, groundbreaking work on debt sustainability by Domar (1944) highlights that the comparison between the economic growth rate and real interest rate determines the debt sustainability condition of a country. If economic growth rate is higher than real interest rate, primary deficit contracts over the time to make debt sustainable. Bowman (1980) highlights that overvalued currencies can result in debt crisis as overvalued exchange rate makes the country's exports expansive for the rest of the world, which results in low foreign inflows to repay debt. In this study, we have followed the proposition of fiscal reaction approach (FRA) to assess debt sustainability proposed by Bohn (1980). According to Bohn, increase in primary balance with increase in debt burden is an indicator of debt bearing potential of the economy so that debt is said to be sustainable if external debt has positive impact on primary balance. Moreover, greater value of coefficient of external debt implies higher state of debt sustainability. Furthermore, Buitier (1985)

maintains that stable debt-to-GDP ratio allows a country to focus on primary balance improvement in order to make debt sustainable. According to Blanchard (1990), debt is sustainable if debt to GNP ratio decreases over the time along with growing primary balance. Buiter and Patel (1990) analyze the debt sustainability problem of India and maintained that reduction in non-development expenditure and increase in tax base can help economy to make debt sustainable.

(Hasan, Chaudhri, & Ahmad, 1999; Ishfaq, Choudhary & us Saqib, 1999; Kemal, 2001) argue that due to twin deficits, Pakistan borrowed from external resources and that resulted into sustainability problem as export earnings did not increase along with debt burden. Bilquees (2003), concluded that exchange rate volatility and budget deficit lessen the positive outcomes of debt. Hence, consistent debt accumulation raises the problem of its sustainability. Further, Prohl and Schneider (2006) conducted panel data study of 15 European Union countries and found strong cointegration between primary deficit and public debt-to-GDP ratio for six countries dealing with debt sustainability issue. Adding to literature, Imimole, Imoughele, and Okhuese (2014) stated that Nigerian economy was facing debt crisis because of low real GDP growth rate, high debt service to export earnings and unstable exchange rate. Iqbal, Turabi, Hussain, and Laghari (2015) employed Johansen cointegration technique and found that low export earnings and non-development expenses deteriorate debt sustainability in Pakistan. Moreover, this study suggests that fiscal consolidation is a prerequisite for Pakistan's debt sustainability, increase in tax and non-tax revenues and high inflow of remittances which can help reducing country's debt difficulty and contributes to maintain debt sustainability condition.

Recently, the literature has highlighted that fiscal and monetary instruments to boost output, rollover risk under long and short-term loan's maturity and institutional bailouts, FDI and structural adjustments are the determinants of debt sustainability Blanchard and Das (2017), Corsetti, Erce, and Uy (2018), Hurley, Morris, and Portelance (2019), Afonso, Huart, Jalles, and Stanek (2019). Moreover, these studies have maintained a positive link of trade openness, low tariff policy, foreign reserves and foreign investment with loan repayment capacity.

#### **4. The Model and Methodology**

The relevant literature has followed Solow growth (1956) model to assess the role of external financing like external debt or foreign aid in promoting economic growth. We have followed Ejigayehu (2013) as it incorporates the need for the external debt for economic growth when domestic resources are not enough to finance desired level of investment. According to Solow (1956), to have optimal level of output ( $Y$ ) economic resources are required:

$$Y_t = fA(L_t, K_t) \quad (1)$$

Where, labor force (L), physical capital stock (K) and total factor productivity (A) are the determinants economic output (Solow, 1956). However, financial capital is required to purchase physical capital. Therefore, countries suffering with low savings ( $NS_t^d$ ) and primary deficit<sup>5</sup> ( $R_t < Gx_t$ ) may seek foreign loans or grants to finance budget deficit and desired public and private investment ( $I_t^d$ ) for growth, in short.

$$NS_t^d < I_t^d \text{ to attain economic growth and } R_t < Gx_t$$

$$\text{so that } Y_t = f(L_t, K_t, ED_t)$$

$$ED_t - ED_{t-1} = ED_{t-1} + Gx_t - R_t \quad (2)$$

Following equation implies that external debt (EDG), foreign exchange earnings (FEEG), gross domestic product per capita (GDPpc), total revenue collection (REVG) and trade openness (TG) are determinants of primary balance (PBG). All the variables used in analysis are in ratio to GDP.

$$\ln PBG_t = \alpha_0 + \alpha_1 \ln EDG_t + \alpha_2 \ln GDPpc_t + \alpha_3 \ln FEEG_t + \alpha_4 \ln REVG_t + \alpha_5 TG_t + \varepsilon_t \quad (3)$$

Equation (3) refers to FRF that states external debt is sustainable if primary balance improves and stays positive with increase in debt burden. This equation is expanded version of equation (2) mentioned by Fatima and Waheed (2016). After analyzing the data of all variables for stationarity test (Augmented Dicky Fuller; ADF), following two equations have been estimated for external debt sustainability by applying ARDL and Bound test approach:

$$\begin{aligned} \ln PBG_{it} = & \alpha_0 + \beta_1 \ln PBG_{t-1} + \beta_2 \ln EDG_{t-1} + \beta_3 \ln GDPpc_{t-1} + \beta_4 \ln FEEG_{t-1} + \\ & \beta_5 \ln REVG_{t-1} + \beta_6 \ln TG_{t-1} + \sum_{n=1}^m \delta_1 \Delta \ln PBG_{t-1} + \sum_{n=0}^m \delta_2 \ln \Delta EDG_{t-i} + \\ & \sum_{n=0}^m \delta_3 \ln \Delta GDPpc_{t-i} + \sum_{n=0}^m \delta_4 \ln \Delta FEEG_{t-i} + \sum_{n=0}^m \delta_5 \ln \Delta REVG_{t-i} \\ & \sum_{n=0}^m \delta_6 \ln \Delta TG_{t-i} + \varepsilon_t \end{aligned} \quad (4)$$

$$\begin{aligned} \ln PBG_{it} = & \alpha_0 + \beta_1 \ln PBG_{t-1} + \beta_2 \ln EDG_{t-1} + \beta_3 \ln GDPpc_{t-1} + \beta_4 \ln FEEG_{t-1} + \\ & \beta_5 \ln REVG_{t-1} + \beta_6 \ln TG_{t-1} + \beta_7 \ln D^* P_{t-1} \sum_{n=1}^m \delta_1 \Delta \ln PBG_{t-1} + \\ & \sum_{n=0}^m \delta_2 \ln \Delta EDG_{t-i} + \sum_{n=0}^m \delta_3 \ln \Delta GDPpc_{t-i} + \sum_{n=0}^m \delta_4 \ln \Delta FEEG_{t-i} + \\ & \sum_{n=0}^m \delta_5 \ln \Delta REVG_{t-i} + \sum_{n=0}^m \delta_6 \ln \Delta TG_{t-i} + \sum_{n=0}^m \delta_7 \ln \Delta D^* P_{t-1} + \varepsilon_t \end{aligned} \quad (5)$$

Equation (4) assesses the long run and short run cointegration level between primary balance, external debt, and other macroeconomic variables. However, the role of domestic policies has been assessed in equation (5) by using the macroeconomic

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5 Where, domestic revenue collection (R) is lower than public expenditures (Gx).

policy index. Literature has listed many determinants of primary balance, for instance, Fincke & Greiner (2012)<sup>6</sup> and Maltritz & Wuste (2015)<sup>7</sup> have found interest rates as an important determinant of primary balance other than per capita income, trade earnings, and public revenue. Similarly, Barbier-Gauchard & Mazuy (2018)<sup>8</sup> have added inflation and financial crisis while modeling primary balance. However, we cannot ignore the properties of the data series when constructing an econometric model; we have not included variables like inflation and interest rate in the modeled equation because of two reasons. First, we have added interest rate as a policy variable in the index, being part of the policy instrument it has already used in the model so that we have not added it, separately. Secondly, we have included variables after assessing their correlation matrix to handle multicollinearity, however, correlation matrix value of foreign exchange earnings and the inflation rate was 0.6 that does not allow having both variables in the model at the same time.

#### 4.1. Construction of index

This study has empirically estimated the role of policies in determining external debt sustainability in Pakistan. Following, Burnside and Dollar (2000), Qayyum, Javid, and Munir (2011) and Masnoor et al (2018), a macroeconomic policy index has constructed through Principal Component Method (PCA). The term  $D*P$  in equation (5) reflects the debt-policies interactive term where  $P$  and  $D$  are representing a series of policy index and external debt, respectively. Moreover, the term  $D*P$  exhibits the role of macroeconomic policy instruments in determining external debt and primary balance relationship in the long run. We have constructed a macroeconomic policy index by adding three policy variables to have a single index series: money supply to GDP ratio (MSG), interest rate (INT) and trade openness (TO). This index has replaced the inflation rate with an interest rate as a policy variable because the literature shows a significant role in the interest rate in determining primary balance (Barbier-Gauchard and Mazuy, 2018). The purpose of this index is to gauge the role of policies in affecting the level of debt sustainability in the long run. The following equation (6) has been estimated to develop the index series, this series has found to be stationary at level. Here,  $\beta_1$ ,  $\beta_2$ , and  $\beta_3$  show the weights of the first components of PCA:

$$\text{Policy Index } (P) = \beta_1 (\text{MSG}) - \beta_2 (\text{INT}) + \beta_3 (\text{TO})$$

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6 Fincke, B. and A. Greiner (2012). How to assess debt sustainability? some theory and empirical evidence for selected euro area countries. *Applied Economics* 28 (44), 3717-3724.

7 Maltritz, D. and S. Wuste (2015). Determinants of budget deficits in europe: the role and relations of fiscal rules, fiscal councils, creative accounting and the euro. *Economic Modelling* 48, 222-236.

8 A.Barbier-Gauchard, & Mazuy, N. (2018, June). Country-specific fiscal reaction functions: what lessons for EMU? *Université de Strasbourg working paper*.

The sign of each variable represents the extent of economic association of that particular variable with primary balance.

$$P = 0.2368 * (MSG) - 0.4759 * (INT) + 0.4509 * (TO) \quad (6)$$

**Table 2:** Variables detail and Data Sources (1980-2019)

Variables	Definition	Data Source
PBG	Primary Balance (as % of GDP)	State Bank of Pakistan
EDG	External Debt (as % of GDP)	State Bank of Pakistan
REVG	Government Revenue (% of GDP)	State Bank of Pakistan
TG	(Export plus Import) divided by GDP	State Bank of Pakistan
GDPpc	Gross Domestic Product per capita	State Bank of Pakistan
MSG	Total Money Supply (% of GDP)	State Bank of Pakistan
FEE	Foreign Exchange Earnings (% of GDP)	State Bank of Pakistan
Int	OverNight Repo Interest Rate	State Bank of Pakistan

#### 4.2. External debt sustainability potential

This study has applied a potential trade calculation method to assess the external debt sustainability potential in the case of Pakistan. Many researchers have employed in-sampling and out-sampling forecasting methods (Boughanmi, 2008; Ferragina, Giovannetti, & Pastore, 2009). This study has employed the in-sample technique to estimate external debt sustainability potential as it has been widely used because of its basic assumption of convergence to mean or average.

External debt sustainability potential is the ratio of predicted external debt over actual external debt:

$$EDP_{it} = \sum \hat{ED}_{it} / \sum \dot{ED}_{it} \quad (7)$$

Where  $EDP_{it}$  is the external debt sustainability potential of Pakistan (i) over the period of analysis (t)  $\sum \hat{ED}_{it}$  is predicted or fitted external debt and  $\sum \dot{ED}_{it}$  is actual external debt. The value of indices greater than 1, i.e.  $EDP_{it} > 1$  indicates that Pakistan has the potential to raise more debt and it is sustainable in the long run as per the economic model used in this analysis. Whereas,  $EDP_{it} < 1$  indicates that Pakistan has exhausted debt sustainability potential and further debt accumulation may drag Pakistan into the debt crisis. The value of  $EDP_{it} = 1$  indicates that actual and predicted external debt is equal, it implies that current external debt is in the short run.

## 5. Estimated Results and Discussion

This study has empirically estimated the long-run debt sustainability in Pakistan with and without a given policy environment. The purpose of this study is to add to the existing literature by three aspects; first, it is important to know the state of debt sustainability in the recent surge of external debt and declining economic growth. Second, if the macroeconomic policies play a vital role in determining the debt sustainability position then what should be the directions of policies. Third, it is important to know the potential external debt burden is important before raising further external debt.

**Table 3:** Augmented Dickey-Fuller

Variables	Intercept		Trend and Intercept	
	Level	First Difference	Level	First Difference
PBG	0.559	-5.845*	-1.608	-6.035*
EDG	-1.356	-5.338*	-1.161	-5.370*
GDPpc	-1.846	-6.981*	-2.075	-6.935*
FEE	-1.69	-3.25**	-2.01	-3.24**
TG	-0.89	-3.05**	-1.42	-3.15**
P*D interactive term	-3.184*	-4.971*	-0.035	-7.356*
REVG	-2.51	-4.61*	-2.92	-4.96*
Significance Levels	Critical Values	Critical Values	Critical Values	Critical Values
1 Percent	-3.621	-3.626	-4.226	-4.234
5 Percent	-2.943	-2.945	-3.536	-3.540
10Percent	-2.610	-2.611	-3.200	-3.202

Note: \*, \*\*, \*\*\* indicates level of significance at 1%, 5%, 10% respectively. All the variables are in log form. Source: Authors' estimation

Table 3 represents the ADF test results. At the traditional 5% level of significance, these results indicate that all variables are stationary at the first difference ( $I_0$ ). As our sample size is limited ARDL method may be used for estimation.

Table (4) presents empirical findings based on the FRF approach to assess the long-run sustainability of external debt in Pakistan.

Table 4 above, present's long run results of the two models. The first model shows the results of equation 4 while second the model includes macroeconomic policy index interactive term (P\*D) in the same model (Equation 5). In both models,

**Table 4:** External Debt Sustainability of Pakistan (FRF): Long-Run Relationship (1980-2019)

Dependent Variable: Primary Balance (% of GDP)				
Variables	Equation 4		Equation 5	
	Coefficient	T-Stats.	Coefficient	T-Stats.
PBG (-1)	0.025	(0.922)	0.071	(1.452)
EDG (-2)	-0.142	(-1.799)***	-0.177	(-1.985)***
GDPpc	0.245	(4.745)*	0.304	(3.950)*
REVG	0.114	(2.078)**	0.187	(2.889)*
FEE(-1)	0.233	(1.790)***	0.207	(1.871)***
TG	0.377	(5.881)*	0.374	(5.061)*
P*D interactive term			-0.075	(-1.269)
C	0.047	(3.210)*	0.058	(3.899)*
Diagnostics				
R-Square	0.841		0.899	
Durbin Watson	1.996		2.014	
F-Statistics (Prob.)	3178.05(0.000)		4001.13(0.000)	
	Test Value	Prob.	Test Value	Prob.
Jarque-Bera Stats.	0.301	0.762	0.322	0.689
Breusch-Godfrey Serial	0.091	0.904	0.089	0.927
Serial Correlation LM	0.429	0.991	0.546	0.822

Note: \*, \*\*, \*\*\* indicates level of significance at 1%, 5%, 10% respectively. All the variables are in log form. Source: Authors' estimation

primary balance and external debt are negatively related to each other which according to Bohn (1980) shows that external debt has just become unsustainable in Pakistan. We have weak evidence (10% level of significance) that external debt is unsustainable through fiscal reaction function with and without Macroeconomic policy interactive term. However, there is evidence for long relation relationship or co-integration in both the models. In fact, we have strong evidence at a 1% level of significance that external primary balance is co-integrated with GDP per capita (GDPpc) and trade openness (TO) in Pakistan. Both variables are positively related to primary balance, however, the coefficient of TO is greater than that of GDPpc in each of the models.

Hence there is statistical evidence that our economic growth and external sector performance play a crucial role in maintaining external debt sustainability but the extent of the impact of TO is greater than GDPpc. Moreover, Revenue Growth has also a strong long-run positive relationship with a primary balance in both the models but the size of the coefficient is relatively small. Our foreign exchange earnings (lag1) are weakly and positively related to PB. The macroeconomic policy index interactive term is found to be insignificant and negative, showing that policies are distortionary and do not have a significant impact on External debt sustainability. According to our results, much work has to be done in this regard. However, the inclusion of the interactive term the second model has enhanced the size of EDG and GDPpc coefficients without jeopardizing the stability of the model as evident from different diagnostic test results. All the coefficients have expected signs. But, one can't ignore the fact that our Foreign exchange earnings are decreasing which is an indication of the stagnant debt repayment capacity of Pakistan. We need to increase our tax collection rapidly otherwise, the probability of more debt accumulation cannot be ruled out. Diagnostic tests indicate that both models are stable and free of heteroskedasticity and autocorrelation problems. Further, adjusted R-square is high, showing strong explanatory power of our model, while other statistics such as F-test and DW stats are also in the satisfactory range.

We have also presented the ARDL Bound test results (Table 5) which confirms

**Table 5:** ARDL Bond test results

Equations	F-stat.	Critical Values		Critical Values	
		(at 1 % level of significance; K=2)		(at 5 % level of significance; K=2)	
		Lower Bound	Upper Bound	Lower Bound	Upper Bound
4	4.92	3.66	4.69	3.05	4.15
5	6.21	2.07	3.99	3.99	4.58

Source: Authors' estimations

the co-integration relationship in both the models at a 5% level of significance as in every model F statics is above the critical range of upper bound.

Following Burnside and Dollar (2000), we have constructed an interactive term (D\*P) to assess the dynamics of EDS that whether or not macroeconomic policies environment is supportive of the utilization of EDG. For instance, an increase in money supply and interest rate simultaneously tend to increase inflation that reduces the aggregate demand in the long run and result in an unfavorable environment which hampers domestic production as export earnings falter. Such policies reduced

the optimal utilization of external debt by financing deficits from external loans. Similarly, trade openness use in policy variables means that the imports of hi-tech machines and industrial material can enhance export potential and debt repayment capacity increases through foreign inflows. Further, high or volatile interest rates and inflation discourage FDI that has a positive relationship with repayment capacity (Hawkins & Turner, 2000; Mansour, 2013; Alfaro & Kanczuk, 2019). Thus, policies play a spirited role in creating avenues to the repayment of debt to keep it sustainable in the long run.

**Table 6:** External Debt Sustainability of Pakistan (FRF): Error-Correction Model (1980-2019)

Dependent Variable: Primary Balance (% of GDP)				
Variables	Equation 4		Equation 5	
	Coefficient	t-Stats.	Coefficient	t-Stats.
D(PBG (-1))	0.015	(1.725)	0.07	(1.589)
D(EDG (-2))	-0.143	(-2.099)**	-0.201	(-1.965)***
D(GDPpc)	0.214	(4.745)*	0.311	(3.991)*
D(REVG)	0.341	(1.078)	0.174	(1.744)
D(FEE(-1))	0.281	(1.89)***	0.139	(1.965)***
D(TG)	0.127	(3.980)*	0.271	(2.990)*
D(P*D) interactive term			-0.144	(-2.010)**
EC(-1)	-0.574	(-3.771)*	-0.467	(-4.101)*
C	0.022	(1.014)	0.019	(1.669)
<b>Diagnostics</b>				
R-Square	0.821		0.833	
Durbin Watson	2.023		1.962	
F-Statistics (Prob.)	2719.50(0.000)		2481.00(0.000)	
	Test Value	Prob.	Test Value	Prob.
Jarque-Bera Stats.	0.455	0.865	0.395	0.901
Breusch-Godfrey Serial	0.792	0.339	0.889	0.604
Serial Correlation LM	2.001	0.45	3.104	0.588

Note: \*, \*\*, \*\*\* indicates level of significance at 1%, 5%, 10% respectively. All the variables are in log form. Source: Authors' estimation

Table 6 presents the short-run dynamics by estimating the VECM model and according to the results in the short run primary balance is not related to external

debt. The error correction term is statistically significant at a 1 % level of significance confirming the existence of long-run relationships among the variables. The negative sign of error correction term indicates there is convergence in the short run or other words, 57% discrepancy is removed each year on average. The negative dynamic relationship between Primary Balance and External Debt indicates that our External debt has become unsustainable even in the short run.

**Table 7:** External Debt Potential of Pakistan

Year	EDit	EDit	EDit	Year	EDit	EDit	EDit
1982	-2.9	-2.32	0.8	2001	1.7	2.15	1.27
1983	-3.8	-3.54	0.93	2002	1.9	2.03	1.07
1984	-2.7	-2.52	0.93	2003	1	1.86	1.86
1985	-4	-3.82	0.95	2004	1.6	1.56	0.98
1986	-4	-3.88	0.97	2005	0.3	0.9	2.98
1987	-3.6	-3.27	0.91	2006	-0.8	-0.64	0.8
1988	-3.7	-4.46	1.21	2007	0.1	-1.53	-15.33
1989	-2.6	-2.5	0.96	2008	-2.5	-1.89	0.76
1990	-1.6	-1.52	0.95	2009	-0.2	-0.45	2.26
1991	-3.8	-3.68	0.97	2010	-1.8	-1.04	0.58
1992	-2.9	-2.83	0.98	2011	-2.6	-2.64	1.02
1993	-1.9	-1.92	1.01	2012	-4.3	-3.77	0.88
1994	-0.2	-0.07	0.35	2013	-3.7	-2.59	0.7
1995	-0.6	-0.43	0.71	2014	-0.9	-1.98	2.2
1996	-0.7	-1.31	1.87	2015	-0.5	-1.42	2.85
1997	-0.2	-0.6	-3.02	2016	-0.3	-0.31	1.03
1998	-0.1	-0.18	1.78	2017	-1.6	-1.23	0.77
1999	1.2	0.24	0.2	2018	-1.7	-1.45	-2.85
2000	1.5	0.79	0.53	2019*	1.5	-1.51	-6.56

Source: Authors' estimations.

We have applied a potential trade calculation method to assess the external debt sustainability potential in the case of Pakistan. The results are shown in Table 7. According to this table, External debt sustainability potential (EDit) was sustainable for the period 2014 to 2016 as EDit coefficient was greater than zero. In 2016 it dropped down to 1.03, pointing towards the fact that Pakistan had lost the capacity for further debt accumulation and there was a need to explore foreign debt alternatives.

On the contrary, our consistent reliance on foreign debt has made it unsustainable. Unfortunately, the government's recent efforts to raise alternative financial resources have resulted in further distortion and at the moment, we are accumulating debt at a historic brisk pace.

## 6. Conclusion and Policy Implications

This study has empirically estimated the level of debt sustainability for Pakistan's economy. According to our results, Pakistan's External debt has become unsustainable as per the FRF approach and we have already exhausted our potential for further debt accumulation. The results show that external debt has a long-run relationship with GDP per capita and trade openness.

In accordance with theoretical foundations, the growing external debt has a negative but weakly significant relationship with primary balance. An increase in government revenues has a significant positive relationship with EDS. The macroeconomic policy index is significant only in the short run. Our policy mix has little coordination with External debt flow. In fact, our policies have a distortionary effect and are a cause of External debt unsustainability. Recent attempts by the government to explore alternative revenue sources are largely ineffective. On the contrary, it has increased cost-push inflation turning already vulnerable real sector into dire recession. It would be difficult for us to refrain from further debt accumulation without restoring real sector performance. In this regard, efforts from our policymakers are yet to be seen.

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