Macroeconomic Determinants of Foreign Indebtedness: Evidence from Pakistan

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Abstract: The intention of conducting this research is to inspect the key macroeconomic determinants of foreign indebtedness in Pakistan. ARDL bound test is applied to annual data ranging from 1976-2018. This paper finds that debt service payment, military spending, and trade openness provoke further external borrowing, whereas growth in economic activity, depreciation of currency and capital inflow help in curtailing the overseas borrowing of our economy. The findings of this study also highlight the role of government revenue and inflation in reducing the debt burden liability. This study recommends that policy making departments should focus on relaxing the trade barriers, enhancing the overall productivity and competitiveness of the markets, stabilizing the exchange rate and designing an optimal level of military budget as all of them are contributing towards reducing the external financial liabilities. Appropriate use of foreign reserves, creating attractive environment for investment and utilization of funds in revenue-oriented projects are also necessary for combating with the issue of foreign indebtedness. Taken together, the assurance of these recommendations will help in meeting the government's financial needs and curtailing the demand for accumulation of external debt.

Key Words: Foreign debt, ARDL, Macroeconomic, Pakistan
JEL Classification: F34, C22, P24

1. Introduction

Foreign debt has remained the subject matter of numerous studies held globally. Researchers are not only interested in investigating its impact on the selected macroeconomic variables like investment and economic growth, but they are also of keen interest to investigate the key determinants of foreign indebtedness which push the economy into deep debt-trap (Minhaj-ud-din et al., 2021). Studies available on this topic has identified various economic indicators that decide about the reliance on external debt like persistent fiscal deficit, low economic growth, continuous depreciation of currency, higher inflation, defense spending, widespread corruption, political instability, huge debt service payment and lack of

domestic resource mobilization (Tiruneh, 2004; Awan et al., 2015; Waheed, 2017). Availability of capital also affects the reliance on foreign debt. Capital abundant countries need less foreign assistant on the aforementioned ground as compared to capital scarce economies. Distortion in the prices of oil also creates deterioration in the balance of payments for most of the developing countries (Zamir et al., 2017). Capital deficiency and inability to repay the previous debt are the other reasons which provoke further external borrowing (Tiruneh, 2004). Similarly distortion in export-imports gap also increases the dependency on external borrowing.

Today, almost every economy is engaged in borrowing funds, but the reasons for choosing foreign financing are different for developed countries as compared to developing economies. Developing countries utilize this channel for meeting with their financial needs and completing the development projects, while developed countries are engaged in foreign borrowing for keeping the economy afloat and prosperous. That's why foreign loans are considered more beneficial for developed countries, as they are engaged in using these funds in revenue-oriented and self-liquidating projects (Atique & Malik, 2012).

To meet with external financial obligations and finance the budget deficit, Pakistan is persistently using its foreign sources of finances like IMF, World Bank, USA, UK and Japan. The current account of Pakistan's BOP indicates trade deficit, which has been repeatedly filled through international donor agencies (Zakaria, 2012). Statistical data indicates that the total volume of Pakistan's stock of external debt accumulation in 2018 has almost reached to US dollar 100 billion as compared to US dollar 65 billion in 2015 (Nawaz et al.,2017). This rapid growth in external debt in the last few years have made this issue more critical for the policy makers who are repeatedly investigating the causing factors of this issue for the last few decades. Figure 1 folds 43 years data of foreign debt for Pakistan.

Figure 1: Foreign Debt in Pakistan (1976-2018)
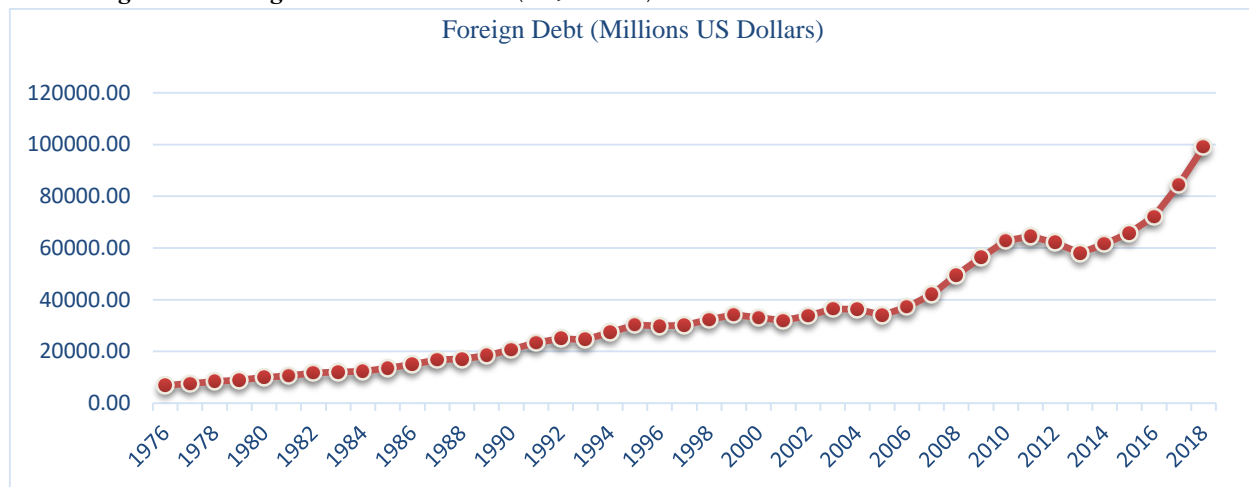
Source: World Development Indicators (2021)

Reasons of foreign indebtedness has remained the core objective of various researches, though they have ended with a mixture of results. Variation in outcomes is then connected with the unavailability of appropriate economic theory that has the potential to describe the exact causes of external financing. In the literature of debt-determinants nexus, we find that foreign indebtedness is linked with currency depreciation, trade openness, large non-development expenditures, higher inflation, consistent twin deficits, and misappropriation of funds in Pakistan (Siddiqui & Malik, 2001; Luke & Joanna, 2008; Atique & Malik, 2012; Akram, 2014; Zafar et al., 2015; Waheed, 2017). For Pakistan, this issue has been explicitly examined by Awan et al. (2011), Zakaria (2012) and Awan et al. (2015). We also find that this issue has been explored by Sheikh et al. (2013) and Azam and Feng (2017) for panel data carrying Pakistan.

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Collectively, their researches ended with indication that decrease in value of currency, unfavorable terms of trade, openness in trade, huge military spending, consistent twin deficits, worsening position of foreign reserves and sluggish economic growth are the reasons of foreign indebtedness in Pakistan (Shakir et al., 2019). Disagreements in the outcomes of these studies intensify the need to explore this area yet further for effective policy outcomes. Therefore, this study intends to fill this vacuum by analyzing the macroeconomic factors that decide about the foreign indebtedness in Pakistan.

This study contributes to the literature of debt-determinants synthesis in three aspects: first, it is different from the previous studies in terms of time period and specification of the model. Second, in country specific analysis, this study has incorporated the impact of GDP per capita, debt service payment and government revenue, which are ignored in country specific studies carrying Pakistan. Third, along with the ARDL bound test and ECM, this study has also deployed appropriate data diagnostic and stability tests, which have been overlooked by most of the previous studies. This article is compiled as under. Section 2 reviews the literature and explores the research gap. Section 3 describes the research methodology and research findings. Section 4 winds up the discussion and presents policy recommendations.

2. Literature Review

Different types of econometric techniques have been used for investigating the macroeconomic factors of foreign debt across the globe. Were (2001) found that expansionary fiscal policy, distortions in terms of trade, deficit in BOP and huge debt servicing are the main reasons behind debt accumulation in Kenya. Similarly, Tiruneh (2004) concluded that debt service payment, growth in imports, and slack growth of the economy are the key determinants of foreign indebtedness. Presbitero (2008) found that deterioration in capital (fixed and human), openness in trade, slow growth process, worsening quality of institutions and hostile position of trade prices are the reasons of foreign indebtedness. Smyth and Narayan (2009) noted that military expenditures and growth in real GDP are the key factors of foreign indebtedness in most of the Middle Eastern countries. Awan et al. (2011) also indicated that devaluation of currency and unfavorable trade prices are the root causes of high indebtedness in Pakistan.

Kizilgol and Evren (2012) depicted that trade openness, higher inflation, unfavorable TOT, foreign reserves, and inflows of FDI are the reasons that determine the stock of external debt in Turkey. Zakaria (2012) revealed that openness in trade, TOT, fiscal imbalances, and inflation are the key stimulating factors of external debt in Pakistan. Similarly, Sheikh et al. (2013) explored that military expenditure is the root cause of external indebtedness in Pakistan and India. While investigating the same issue for Nigeria, Imimoli, Ehikioya and Asin (2014) found that growth rate of GDP, debt servicing, and exchange rate are the factors that decide about the burden of debt. Awan et al. (2015) highlighted that budget deficit, devaluation of currency, and openness in trade are the causes of foreign indebtedness in Pakistan. For Al-Fawwaz (2016), these factors were the sluggish economic growth and growth in external trade. For Bolukbas (2016), trade openness was found to be the sole cause of foreign indebtedness. Similarly, Waheed (2017) indicated eight factors that could be held responsible for foreign indebtedness in those economies who are engaged in trade of oil and gas. These factors were the economic growth, government revenue, domestic saving, trade deficit, FDI, domestic investment and price of oil. For exploring the link between military expenditures and foreign indebtedness in ten Asian economies, Azam and Feng (2017) found that military expenditures, foreign reserves, and economic growth are the factors that significantly affect the volume of external financial liabilities in these countries. Butkus and Seputiene (2018) identified that sound institutional quality factors has the ability to prevent the harmful impacts of public debt.

Conclusively, we find only Awan et al. (2011), Zakaria (2012), Sheikh et al. (2013) and Awan et al. (2015) who have tried to analyze the impact of fiscal deficit, TOT, exchange rate, trade openness, growth in

economic productivity, foreign reserves, defense expenditures, and foreign aid on the stock of foreign debt in Pakistan. However, the impact of growth in GDP per capita, debt servicing and government revenue on the stock of foreign debt has been overlooked by these studies. Along with other variables, this study intends to extend the line of research by inspecting the impact of these variables on the accumulation of foreign debt in Pakistan. Table 1 presents the brief summary of empirical literatures on the determinants of foreign debt.

Table 1: Summary of the Empirical Literature

Author (s)	Sample Period, Country (s)	Method (s)	Dependent Variable	Independent Variables	Finding (s)
Were (2001)	Kenya 1970-1995	ECM	Real GDP growth rate	ED, DSP, TOT, education, investment, inflation and ER	Expansionary fiscal policy, increase in DSP, and distortion in trade policy are the root causes of external debt accumulation.
Tiruneh (2004)	60 Developing countries 1980-1990	REM & FEM	ED	Exports, DSP, capital outflow, TOT, imports, growth rate of GDP and population growth	Increase in DSP, imports, capital flight and decrease in GDP are the reasons of high indebtness.
Presbitero (2008)	114 Developing countries 1980-2004	System GMM	Real GDP per capita	Investment, population growth, education, TO, inflation, TOT, institutional quality and ED	Investment in human capital, TO, growth in real GDP per capita, and institutional quality are the key determinants of high indebtness.
Smyth & Narayan (2009)	6 Middle Eastern Countries 1988-2002	DFE, DOLS & FMOLS	ED	Real GDP and MS	Increase in MS causes the ED to grow, whereas increase in GDP is causing the ED to fall.
Awan et al. (2011)	Pakistan 1974-2008	JCT & VECM	ED	TO, TOT, ER, BD and foreign trade	Depreciation of currency and deterioration in TOT affect the foreign debt positively.
Kizilgol (2012)	Turkey 1990-2012	ARDL & GMM	ED	TO, TOT, BD, FDI, FR and inflation rate	TO, TOT and inflation affect the ED positively, while foreign reserves and FDI affect it negatively.
Zakaria (2012)	Pakistan 1972-2010	GMM	ED	TO, TOT, BD, FDI, FR and inflation rate	TO, TOT, BD and inflation affect the debt burden positively, while FR and FDI affect it

					negatively.
Sheikh et al. (2013)	Pakistan & India 1972-2010	ARDL	ED	Real GDP, FR, ME and exports	MS is affecting the ED positively, while the remaining variables are affecting it negatively.
Imimole et al. (2014)	Nigeria 1986-2010	ECM & JCT	ED	TOT, DSP, TO, BD, GDP, FDI and ER	BD and ER are affecting the ED positively, while GDP and FDI are affecting it negatively.
Awan et al. (2015)	Pakistan 1976-2010	ECM & ARDL	ED	BD, TO, TOT, ER and foreign aid	BD, ER and TO are affecting the foreign debt positively.
Al-Fawwaz (2016)	Jordan 1990-2014	ARDL	ED	TO, TOT, ER and GDP per capita	TO affects the ED positively, while GDP affects it negatively.
Bolukbas (2016)	Turkey 1998-2011	ECM & JCT	ED	TO and ER	TO affects the ED positively.
Waheed (2017)	24 OGEIC 2004-2013	Panel Least Square	ED	Real GDP growth, current account balance, GE, GR, FR, GFCF and inflation	GDP, GR, and domestic savings affect the ED negatively, while trade deficit, and inflation rate are the reasons of public indebtness.
Azam & Feng (2017)	10 Asian Countries 1990-2011	REM & FEM	ED	MS, GDP, FR, tax revenue, inflation, and GDP per capita	MS affects the ED positively, while FR affects it negatively.
Butkus & Seputiene (2018)	152 Developing Countries 1996-2016	System GMM	Growth rate of GDP per capita	Inflation rate, populace, size of government, human resources, foreign trade, investment, GE, government efficiency and government loan	Sound institutional framework and trade balance prevent the adverse effects of foreig debt

Note: ED – external debt; TOT – terms of trade; DSP – debt service payment; TO – trade openness; BD – budget deficit; ER – exchange rate; FR – foreign reserves; GR – government revenue; GE – government expenditure; ME – military expenditure; FMOLS – fully modifies OLS; DOLS – dynamic OLS; DFE – dynamic fixed effect; FEM – fixed-effects model; REM – random-effects model; JCT – Johansen co-integration test; VCM – vector correction model.
Source: Author's compilation

3. Research Methodology

3.1 Theoretical Framework

Developing countries need monetary support either due to deficiency of saving, or shortage of foreign reserves, or inefficiency of capital or due to external macroeconomic environment of the indebted countries. Policy makers are agree that poverty is the sole cause of pushing the economy into deep debt-trap, as it consumes major portion of the public savings in meeting with the external financial liabilities and leaves very little for public investment which is necessary for growth and prosperity of the economy. Resultantly, the gap between saving and investment is further widened and country is re-trapped in the vicious circle of debt and poverty (Taylor, 1994).

The second reason of foreign indebtedness is the shortfall in foreign exchange reserves. Researchers believe that even if emerging economies manage to cover the savings-investment gap, the shortfall in foreign exchange reserves may remain an obstacle to stimulate the economy (Tiruneh, 2004). The third factor, which influences the external debt burden, is the marginal efficiency of capital (MEC). The Neoclassical economists argue that MEC in developing economies is higher than the developed economies, therefore, it is important to mobilize this Capital so that less developed economies may produce higher returns that will benefit both economies in the long run (Tiruneh, 2004).

Researchers also believe that even if we cover these areas, there are so many external factors that have the strength to affect the magnitude of foreign indebtedness. Political instability, exploitation of government funds, hipper inflation, budget deficit, unfavorable balance of payment, lack of developmental projects, external financial liabilities, and devaluation of currency are the external reasons of overseas borrowing (Were, 2001; Presbitero, 2008: Bolukbas, 2016; Butkus & Seputiene, 2018).

3.2 Conceptual Framework

As discussed above, foreign indebtedness depends on too many factors. However, this study is centered to encounter the impact of economic productivity, stability in exchange rate, capital inflow (foreign aid and FDI), price stability, financial / budgetary position of the government (public revenue and expenditures), debt servicing liabilities, trade openness and military budget on the stock of foreign debt. Figure 2 is the conceptual model of this study.
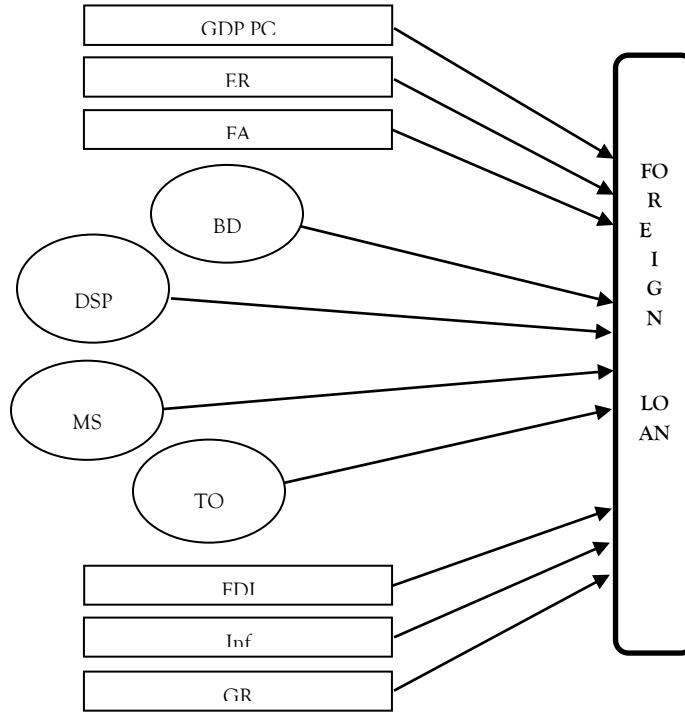
3.3 Estimation Procedure

ARDL bound test has been used for the achievement of research objectives. Rationale for choosing this tool is the ability of this test to provide impartial and proficient results as compared to other techniques1. Table 2 presents the summary of estimation procedure for this model.

Table 2: Estimation Procedure

Step	Test(s)	Purpose
1	ADF & PP Tests	Stationarity of data
2	F-Bound Test	Long run cointegration
3	ARDL	Long run analysis
4	ECM	Short run analysis
5	BPG	Serial correlation
	LM	Heteroscedasticity
	Jarque-Bera (JB)	Normality of residual
	CUSUM & CUSUM SQ	Stability of the regression model

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[1]*First*, it avoids the issues of endogeneity and autocorrelation,*second*, estimating dynamics of the model for both the periods, t*hird*, containing the capacity to sketch better results for small sample size, and f*ourth*, no requirementof pretesting the order of integration.

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Figure 2: Conceptual Framwork

Source: Author's Construction

3.4 Specification of the Model

The following specification of ARDL model has been used in this study.

$$\Delta ed_t = \lambda_0 + \sum_{i=1}^{n} \lambda_1 \Delta ed_{t-1} + \sum_{i=0}^{n} \lambda_2 \Delta to_{t-1} + \sum_{i=0}^{n} \lambda_3 \Delta bd_{t-1} + \sum_{i=0}^{n} \lambda_4 \Delta gd\, p_{t-1} +$$
$$\sum_{i=0}^{n} \lambda_5 \Delta d\, sp_{t-1} + \sum_{i=0}^{n} \lambda_6 \Delta ms_{t-1} + \sum_{i=0}^{n} \lambda_7 \Delta g\, r_{t-1} + \sum_{i=0}^{n} \lambda_8 \Delta e\, r_{t-1} + \sum_{i=0}^{n} \lambda_9 \Delta i\, nf_{t-1} +$$
$$\sum_{i=0}^{n} \lambda_{10} \Delta f\, a_{t-1} + \sum_{i=0}^{n} \lambda_{11} \Delta f\, di_{t-1} + \mu_1 ed_{t-1} + \mu_2 to_{t-1} + \mu_3 bd_{t-1} + \mu_4 gdp_{t-1} + \mu_5 dsp_{t-1} +$$
$$\mu_6 ms_{t-1} + \mu_7 gr_{t-1} + \mu_8 er_{t-1} + \mu_9 inf + \mu_{10} fa_{t-1} + \mu_{11} fdi_{t-1} +$$
$$\epsilon_j \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (1)$$

Where λ_1 to λ_{11} are the short run and μ_1 to μ_{11} are the long run coefficients of the ARDL model. Descriptions of the remaining variables are enlisted in Table 3. In the presence of cointegration (when H_0 is rejected), the following long-run ARDL model will be used in this study.

$$\Delta ed = \lambda_0 + \sum_{i=1}^{n} \lambda_1 \Delta ed_{t-1} + \sum_{i=0}^{n} \lambda_2 \Delta to_{t-1} + \sum_{i=0}^{n} \lambda_3 \Delta bd_{t-1} + \sum_{i=0}^{n} \lambda_4 \Delta gd\, p_{t-1} +$$
$$\sum_{i=0}^{n} \lambda_5 \Delta d\, sp_{t-1} + \sum_{i=0}^{n} \lambda_6 \Delta ms_{t-1} + \sum_{i=0}^{n} \lambda_7 \Delta g\, r_{t-1} + \sum_{i=0}^{n} \lambda_8 \Delta e\, r_{t-1} + \sum_{i=0}^{n} \lambda_9 \Delta i\, nf_{t-1} +$$
$$\sum_{i=0}^{n} \lambda_{10} \Delta f\, a_{t-1} + \sum_{i=0}^{n} \lambda_{11} \Delta f\, di_{t-1} + \omega_j \ldots \ldots \ldots \ldots \ldots (2)$$

The short-run coefficients for this model will be estimated through transformation of equation 1 into Error Correction Model in the following manner.

$$\Delta ed_t = \delta_0 + \sum_{i=1}^{n} \delta_1 \Delta ed_{t-1} + \sum_{i=0}^{n} \delta_2 \Delta to_{t-1} + \sum_{i=0}^{n} \delta_3 \Delta bd_{t-1} + \sum_{i=0}^{n} \delta_4 \Delta gd\,p_{t-1} + \sum_{i=0}^{n} \delta_5 \Delta d\,sp_{t-1} + \sum_{i=0}^{n} \delta_6 \Delta ms_{t-1} + \sum_{i=0}^{n} \delta_7 \Delta g\,r_{t-1} + \sum_{i=0}^{n} \delta_8 \Delta e\,r_{t-1} + \sum_{i=0}^{n} \delta_9 \Delta i\,nf_{t-1} + \sum_{i=0}^{n} \delta_{10} \Delta f\,a_{t-1} + \sum_{i=0}^{n} \delta_{11} \Delta f\,di_{t-1} + \delta ecm_{t-1} + \omega_t \ldots\ldots\ldots\ldots (3)$$

3.5 Rational for the choice of variables

Foreign debt is the loan payable in foreign currency to the money lenders in the future. The ratio of foreign loan to GDP is used as indicator of foreign indebtedness. Approximately, all studies related to debt-determinants have used this variable as dependent variable in their analysis. Trade openness is the elimination or relaxation of/in barriers on trade. Kizigol and Evren (2012), Zakaria (2012), Al-Fawwaz (2016) and Bolukbas (2016) found that ease in access to international market needs more foreign currency for availing maximum benefit from the prevailing trade opportunities. Similarly, demand for foreign debt also increases with increase in budget deficit, if government is unable to finance this deficit through other means (Imimole *et al.,* 2014).

Countries with faster economic growth rate are expected to pay off debt and decrease their dependency on external debt in the future (Azam & Feng, 2017). Similarly, Were (2001) and Tiruneh (2004) found that external debt accumulation is directly proportional to debt service payment. Therefore, increase in cost of debt will lead to increase the demand for foreign debt. Higher military spending is also an indicator of increase in demand for external debt. Azam and Feng (2017) indicated that increase in military expenditures causes the burden of debt to grow.

Increase in government revenue also helps in meeting with the government's financial needs and, therefore, decreasing the demand for accumulation of external debt (Waheed, 2017). Similarly, increase in price of currency (exchange rate) and commodities (inflation) not only depreciate the national currency but also increase the nominal value of external debt (Kizilgol & Evren, 2012; Zakria, 2012; Awan *et al.,* 2015; Waheed, 2017). That's why this study assumes that higher inflation will decrease the demand for external debt in the long.

Foreign aid includes the flow of voluntary capital to developing countries. Higher flow of foreign aid to a country denotes the presence of high foreign reserves and, hence, lower demand for foreign debt. FDI indicates the level of investment made by a nation in the enterprises of other country. Growth in inflow of FDI is presumed to bring downfall in overseas borrowing (Kizilgol & Evren, 2012).

Table 3: Descriptions of variables (ED is the dependent variable)

Variable	Symbol	Definitions / Unit	Source
Trade openness	To	(exports + imports)/GDP *100	WDI (2021)
Budget deficit	bd	'bd" as percent of GDP	Pakistan Economic Surveys
Gross domestic product	gdp	Growth rate of GDP per capita	WDI (2021)
Debt service payment	dsp	"dsp" as percent of exports[2]	WDI (2021)
Military spending	ms	"ms" as percent of GDP	WDI (2021)

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[2]In literature, we find three indicators representing the liquidity obligations with respect to debt servicepayment. *First*, the ratio of "dsp" to GDP; *second*, the ratio of "dsp" to exports earning; and *third*, the ratio of "dsp" to government revenue. In this study, we are using the second indicator as representative of debt service payment as it has the privilege of analyzing the liquidity position and highlighting the impact of inter-temporal trade-offs occurred from previous borrowings of the indebted country (Clements, 2003; Cordella, 2005).

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Government revenue	gr	"gr" as percent of GDP	State Bank of Pakistan Economic Research Division
Exchange rate	er	Exchange rate	
Inflation	inf	Growth rate of CPI	WDI (2021)
Foreign aid	fa	"fa" as percent of GDP	WDI (2021)
Foreign direct investment	fdi	"fdi" as percent of GDP	WDI (2021)

4. Results and Discussion

4.1 Stationarity Tests

The estimates of ADF and PP tests are summarized in Table 4, which indicate that data is stationary either at I(0) or at I(1), both with intercept and with intercept and trend. Therefore, H_0 is rejected and we have to proceed with the ARDL model.

Table 4: Unite Root Tests (ADF and Phillips-Perron Tests)
Null Hypothesis: Unit Root

Variable	ADF-Test (With Intercept)		ADF-Test (With Intercept and Trend)		PP-Test (With Intercept)		PP-Test (With Intercept and Trend)	
	t-Stat	Remarks	t-Stat	Remarks	t-Stat	Remarks	t-Stat	Remarks
ed	-5.281*	F	-5.207*	F	-5.150*	F	-5.061*	F
to	-6.150*	F	-6.280*	F	-7.667*	F	-8.098*	F
bd	-5.522*	L	-6.107*	L	-5.520*	L	-6.511*	L
gdp	-4.533*	L	-4.566*	L	-4.572*	L	-4.523*	L
dsp	-6.546*	F	-6.477*	F	-6.546*	F	-6.477*	F
ms	-6.532*	F	-6.481*	F	-6.531*	F	-6.481*	F
gr	-8.910*	F	-8.855*	F	-8.910*	F	-8.855*	F
er	-3.646*	F	-4.445*	F	-3.696*	F	-3.910**	F
inf	-5.223*	L	-5.154*	L	-5.362*	L	-5.301*	L
fa	-7.379*	F	-7.376*	F	-8.751*	F	-8.779*	F
fdi	-4.320*	F	-4.294*	F	-6.839*	F	-6.955*	F

* & ** indicate the stationarity of data at 1% or at 5% level of significance. L and F indicate the stationarity of data at I(0) or at I(1).

4.2 ARDL Bound Cointegration Test

The purpose of using this test is to investigate the presence of long-run cointegration among the variables. Before applying this test, we have to apply the F-Bound test for finding the long-run cointegration. Table 5 depicts that the calculated F-statistics value (i.e. 9.2310) is bigger than the upper bound tabulated values at all critical levels. It means that H_0 is rejected and we are in a position to deploy the ARDL model for estimating the long-run dynamics of the model.

Table 5: F-Bound Test
H_0: No Cointegration

Critical Values	F-statistics (calculated value) 9.2310

	Lower Bound	Upper Bound
10 %	01.8	02.9
05 %	02.0	03.2
2.5 %	02.2	03.5
01 %	02.5	03.8

4.3 Long-Run Estimates

Table 6 presents the brief summary of these results. It tells that all parameters are statistically significant either at 1% or at 5% or at 10% level of significance. One percent increase in Budget deficit, debt servicing, military expenditures and trade openness are causing 0.04%, 0.11%, 2.09% and 0.23% increase in stock of foreign debt in Pakistan. Similarly, one percent increase in GDP per capita, exchange rate, foreign aid, FDI, inflation rate and government revenue are causing the foreign indebtedness to drop by 1.03%, 0.31%, 0.66%, 2.86%, 0.26%, and 0.85%, respectively.

Table 6: Long-Run Estimates

Variables	Coefficients	t-Statistics	p-Value
$(bd)_t$	0.043	0.696	0.496
$(dsp)_t$	0.112**	2.151	0.047
$(er)_t$	-0.310**	-2.102	0.051
$(fa)_t$	-0.669***	-1.920	0.072
$(gdp)_t$	-1.032*	-5.749	0.000
$(gr)_t$	-0.851***	-2.065	0.055
$(inf)_t$	-0.263*	-3.808	0.001
$(ms)_t$	2.093*	4.202	0.000
$(to)_t$	0.230***	2.017	0.060
$(fdi)_t$	-2.867*	-5.210	0.000
C	7.194	1.356	0.193

*, ** & *** indicate the stationarity of data at 1% or at 5% or at 10% level of significance.

4.4 Short-Run Estimates

The negative sign and p-value of the ECM demonstrate that speed of convergence towards the long-run equilibrium is 79%. Overall, the disequilibrium will congregate back to the long run equilibrium in approximately 15 months. Table 7 presents the summary of these estimates.

Table 7: Short Run Estimates (ECM)

Variable	Coefficient	t-Statistics	p-Values
$\Delta(bd_t)$	0.531	1.551	0.159
$\Delta(dsp_t)$	-0.005	-0.064	0.949
$\Delta(er_t)$	-0.306	-1.790	0.111
$\Delta(fa_t)$	-2.443**	-3.302	0.010
$\Delta(gdp_t)$	-0.784	-1.675	0.132
$\Delta(gr_t)$	1.048	1.444	0.186
$\Delta(inf_t)$	-0.070	-0.817	0.437
$\Delta(ms_t)$	1.974***	1.061	0.073
$\Delta(to_t)$	0.167	0.844	0.423
$\Delta(fdi_t)$	-0.781	-0.581	0.576
$\Delta(ecm_t)$	-0.793	-2.979	0.007
C	-1.297	-1.529	0.1646

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4.5 Diagnostic Tests

Table 8 and Table 9 presents the summary of diagnostic tests, whereas, Figure 3 and Figure 4 demonstrate that coefficients of the variables are stable as the CUSUM and CUSUM SQ stay inside the 5% critical boundaries.

Table 8: Summary of the Diagnostic Tests

Test	Results	Inference
BPG	The resulted value was insignificant	No issue of serial correlation
LM	The resulted value was insignificant	No issue of heteroscedasticity
JB	The resulted value was insignificant	Residuals were normally distributed
CUSUM & CUSUM Sq	All estimates stay inside the 5% critical boundaries	Model is stable

Table 9: Diagnostic Tests

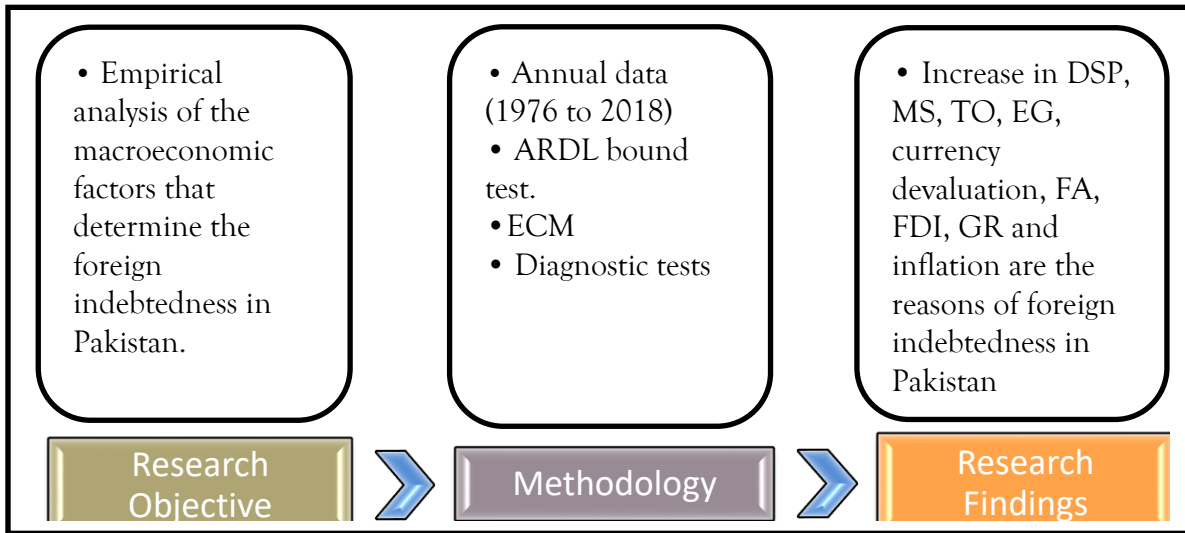| Test	Estimate	F-Statistic (P-value)
DW	2.0539	~~~
BPG	~~~	0.8142 (0.683)
LM	~~~	0.7093 (0.412)
JB	1.2128 (0.545)	~~~
R^2	0.95	~~~
$\bar{R}^2$	0.93	~~~

Figure 3:CUSUM Test

Figure 4:CUSUM SQ - Test
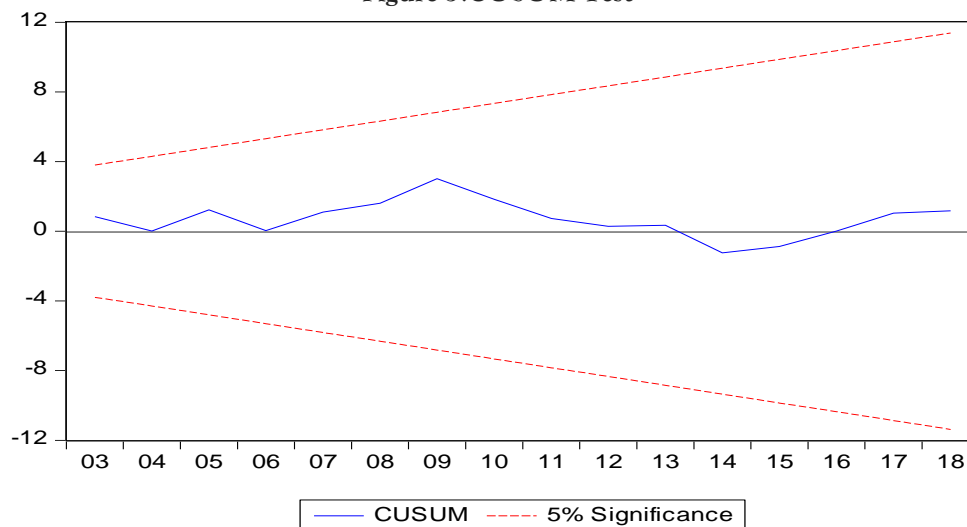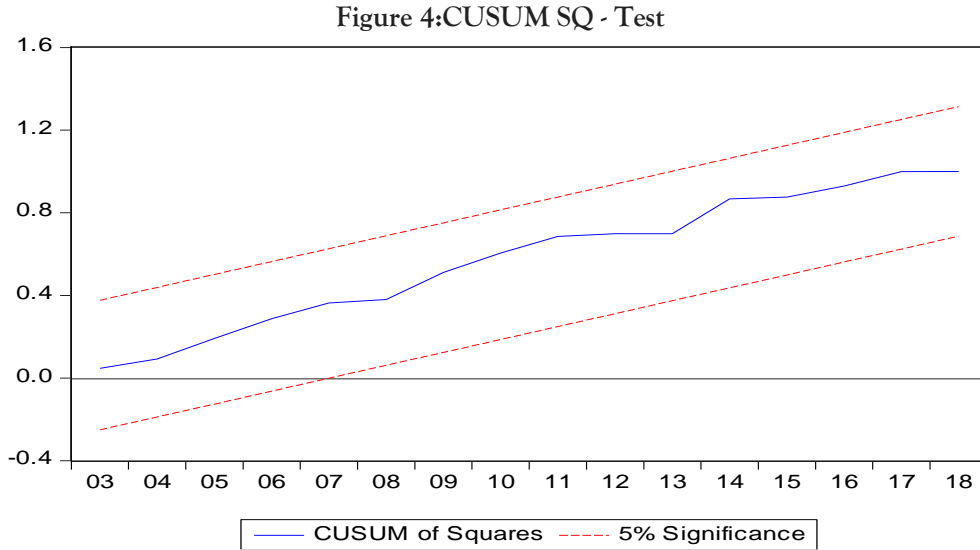
Overall, research findings show that increase in fiscal deficit, cost of debt, military budget and openness in trade are the reasons of foreign indebtedness in Pakistan. In contrast, economic growth, currency devaluation, inflows foreign aid and FDI, increase in public revenue and higher inflation can play a preventive role by decreasing the stock of foreign debt. Figure 5 summarizes the objectives, methodology, and research findings of this study.

Figure 5: Graphical Abstract

• Empirical analysis of the macroeconomic factors that determine the foreign indebtedness in Pakistan.	• Annual data (1976 to 2018) • ARDL bound test. • ECM • Diagnostic tests	• Increase in DSP, MS, TO, EG, currency devaluation, FA, FDI, GR and inflation are the reasons of foreign indebtedness in Pakistan
Research Objective	Methodology	Research Findings

Source: Author's Construction

Minhaj Ud Din[1], Kashif Saeed[2], Sanam Wagma Khattak[3], Arooj Fatima[4], Noman Bashir[5], Sami Ullah[6*]

5. Conclusion and Policy Recommendations

The main focus of this study was to explore the key macroeconomic factors of foreign debt in Pakistan by using the ARDL model for a period of 1976 to 2018. Results depicted that fall in government revenue, currency appreciation, fall in foreign aid and FDI, lower inflation, and sluggish economic growth are the reasons of foreign indebtedness in Pakistan. Cost of debt, military expenditures and openness in trade were found as key stimulating factors of external debt, as they were found to have positive and statistically significant correlation with the stock of foreign debt. 1% increase in these variables was observed to increase the demand for foreign debt by 0.11%, 2.09%, and 0.23%, respectively. Similarly, one percent increase in economic growth, exchange rate, foreign aid, inflow of FDI, inflation rate and government revenue were found to bring a downfall in foreign indebtedness by 1.03%, 0.31%, 0.66%, 2.86%, 0.26%, and 0.85%, respectively. The ECM model was found convergent to the long run equilibrium and the speed of convergence was 79%.

Since debt service payment reinforces the stock of foreign debt to grow, therefore, enhancing the government revenue through increase in exports and inflow of FDI stand mandatory for restricting the government reliance on foreign debt. Appropriate use of foreign reserves, creating attractive environment for investment, utilization of funds in revenue-oriented projects, moderate level of inflation, stability of currency, and maintain an optimal level of military budget are also necessary for combating with the issue of foreign indebtedness. Combinely, the assurance of these recommendations will help in meeting the government's financial needs and, consequently, the demand for external debt will fall.

5.1 Suggestions for Future Research

This study is limited to the variables incorporated in the debt-determinants model. However, we find so many other factors that has the ability to affect the foreign indebtedness. For instance, the institutional quality factors, such as good governance and control on corruption, have the ability to shape the foreign indebtedness accordingly. Therefore, these variables may be added to the debt-determinants model for investigating their impact on the foreign indebtedness of Pakistan. The reason for exclusion of this variable from this study was the unavailability of data for these variables before 2002. Similarly, this study may also be extended to other countries of the region for the purpose of conducting cross country analysis.

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