ISSN Online: 3006-4708
SOCIAL SCIENCE REVIEW ARCHIVES ISSN Print: 3006-4694
https://policyjournalofms.com

The Impact of Foreign Debt on Economic Growth: A case study of Pakistan

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DOI: https://doi.org/10.70670/sra.v3i2.583

Abstract:
Pakistan has depended much on foreign debt to manage its balance of payments deficit. The heavy dependence on foreign debt became uncontrollable in the late 1980's. The main aims of this paper are to explore the impact of foreign debt on economic growth of Pakistan. To achieve this objective, data was collected from different sources for the period 1980-2021. The variables selected for this study included GDP per capita as dependent variable while foreign debt, foreign direct investment, gross capital formation and trade openness as independent variables. This study used statistical techniques such as ADF's unit root test to check stationary, different outlier test are used to check outlier in the model. The study contains different techniques to verify autocorrelation, problem of heteroscedasticity, misspecification in the data and normality issue in error term. The results show that there is no autocorrelation, heteroscedasticity, misspecification and normality issue in error term. The study results show that foreign debt had adverse impact on GDP per capita while trade openness, gross capital formation and foreign direct investment had positive effect on GDP per capita during the period of this study. This study suggests that Pakistan must decrease foreign debt level and motivate natural resources and tax revenue, exports, efficiency and productivity.

Keywords: GDP pe capita, foreign debt, Foreign direct investment, Gross capital formation and Trade openness,

Introduction:

Foreign debt is a global phenomenon that exists in all countries across the world because of their independent existence. Foreign debt is the loan that a country borrows for its development. It is considered as a complex source but a temporary factor (Zouhaier & Fatma, 2014). Since late 1950, many countries have regularly and continuously experienced a current deficit. It means that they import more than exports. So, they are encouraging to borrow money from different institutions like the IMF, World Bank and Western countries to invest in their economic growth. This borrowing is used as to boast their economies. The role of foreign debt is important in financing developmental processes. But their relationship is complicated. To know whether the effect of foreign debt on economic growth is good or bad it depends greatly on how state use of it. It is studied that foreign debt is a significant source of income for developing countries (Safdari & Mehrizi, 2011). World Economic Forum reports in 2021, the world's debt hit a new record of $303

trillion, which was a significant increase from the previous record of $226 trillion in 2020, as reported by the IMF (W E F report 2023). Pakistan is developing and emerging nation on the globe that is always struggling with significant foreign debt issues. Since it was found that in 1947, Pakistan's foreign debt has been rising, and it is doing so quickly each year, which results in ongoing currency devaluation. This situation is getting worse day by day. In the last 20 years Pakistan loan carry spans are burdened the economy (Atique & Malik, 2012). The foreign Debt of Pakistan rose from 37.8 billion US dollar in 2000 to 55.87 billion US dollar by the end of 2010. In 2011 external debt was 59.47 billion dollars. 2001, Pakistan has been categorized by the World Bank as a multiple-indebted country in South Asia. In 2017, loan repayments (principal and interest) totaled USD 6.4 billion, with debt of 56.4 billion USD (ESP 2018-19).

The study aims to investigate the impact of external debt on growth. The are different views of many researchers. Some are in the view that there are positive aspects (Zaman & Arslan, 2014 and Uchenna et al, 2017) and some are supported negative aspects to external debt (Kurihara, 2015 and Siddique et al, 2017) by using different estimation techniques. Various analysts believe that when the foreign debt is used properly it will boost capital inflow while when it used to growth-related expenses, will raise the rate of economic expansion. A country's human and material resources can be mobilized for economic growth through access to foreign markets, managerial know-how, technology, and technical experience, in addition to foreign money for industrial development. Over time, investment becomes limited by external debt collection, which would lower economic progress.

This study's primary motivation was the inconsistent results in the literature, which tried to find out how Pakistan's economic growth was impacted by its foreign debt using modern estimation technique Robust Least Square Estimation.

Literature review:

Theoretical literature reviews:

The literature that supports negative impact of external debt on economic growth are based on the theory of "debt overhang" developed by Krugman in the late 1980s. A debt overhang occurs when the present value of the expected income of a country is less than the accumulated debt.

The Debt OverhangTheory:

The Debt Overhang Theory, introduced by Krugman in 1988, describes a scenario where a country's debt surpasses its future capacity for repayment, particularly relevant to developing nations. This excessive debt burden can redirect all earnings toward servicing existing debt instead of funding new investment projects, often resulting from an output gap or underemployment of resources. Krugman argues that a higher debt stock alters the benefits for both creditor and debtor economies, and relief from debt can be mutually beneficial. Debt relief involves reorganizing debt terms, including reducing the principal amount, lowering interest rates, and revising loan terms to provide relief to the indebted country.

Ejigayehu (2013) explores the influence of foreign debt on economic growth, emphasizing the "debt overhang effect." This effect arises from debt creating obligations for debt service, diminishing the benefits of external debt in investment projects. The debt overhang effect leads to increased debt servicing that the government cannot afford, diverting output to service external debt and hindering investment and economic growth.

Three theories explain the impact of external debt on economic growth:

Neoclassical Theory: This theory highlights the adverse impact of external debt on economic growth. Governments may resort to external debt to cover expanding budget deficits, displacing private investment and raising interest rates, thus hindering economic growth.

Keynesian Theory: This theory emphasizes the positive effect of external debt on economic growth. Financing the budget through external debt encourages private investment due to the inelastic nature of private investment in response to interest rates, thereby promoting economic growth.

Ricardian Equivalence Theory: This theory posits that external debt has no direct impact on economic growth because individuals pay off the debt in the future, thus not influencing interest rates, private investment, or economic growth. Changyong, Jun, and Chen (2012) examine the relationship between foreign debt and economic growth, utilizing a theoretical model based on the Ramsey-Cass-Koopmans framework. Their analysis suggests that a low debt transformation rate, coupled with an increase in the debt ratio beyond a certain point, will decrease the equilibrium capital level, impeding economic growth. Ocampo (2004) contends that the external debt situation for many low-income countries, especially in Africa, has become notably challenging. Traditional mechanisms of rescheduling and debt reduction, along with continued provision of concessional financing and adherence to sound economic policies, may not be sufficient to achieve sustainable external debt levels without additional external debt. Debt overhang affects economic reforms, stable monetary policies, export promotion, and a reduction in certain trade barriers, making the economy more market-friendly and enhancing trade performance.

Smyth and Hsing (1995) test the impact of federal government debt on economic growth, exploring the existence of an optimal debt ratio maximizing economic growth. The author calculates an optimal debt ratio (DEBT/GDPT) corresponding to the maximum real GDP growth rate (38.4%). Chowdrg (1994) argues that the burden of external debt leads to mismanagement in highly indebted countries, contributing to exchange rate mismanagement, speculative capital flight, currency devaluation, increased costs of debt service obligations, deterioration of budget deficits, and impacts on money supply and inflation. Eaton (1993) explores the relationship between foreign debt and economic growth using neoclassical and endogenous growth models. The study finds that an increase in foreign debt can promote economic growth, while a decrease in the inflow of foreign debt, caused by rising borrowing costs, would reduce economic growth in the long run. Divergent views exist concerning the relationship between foreign debt and economic growth. Nweke (1990) emphasizes the necessity of a correct analysis of external debt in third-world countries like Nigeria, considering the country's forceful integration into the Western capitalist economy as a peripheral appendage providing natural resources and cheap labor for Western industrialization. This integration includes providing lucrative markets for surplus products of advanced countries, with the advanced countries obtaining these products at a high cost.

Empirical literature:

Lim & Groschek (2021) investigated the impact of public debt, foreign direct investment (FDI), and remittances on Switzerland's economic growth using data from the World Development Indicators (WDI) from 1997 to 2016. Employing the Auto Regressive Distributive Lag (ARDL) model, the study found positive effects of public debt, FDI, and remittances on Switzerland's economic growth, aligning with economic theories. Kharusi and Ada (2018) examined the relationship between external debt and economic growth in Oman from 1990 to 2015, using the Autoregressive Distributed Lag cointegration approach. Their findings revealed a negative impact of external debt on economic growth. Uchenna, et al (2017) explored the effect of external debt on economic growth in Nigeria from 1981 to 2015, employing ordinary least squares. The study concluded that external debt had a significant and positive impact on economic growth, indicating its use for investment projects rather than consumption.

Siddique, et al (2017) focused on the impact of external debt on economic growth in Pakistan from 1975 to 2015, using autoregressive lag distributed bound testing. The results indicated a significant

negative impact of external debt on Pakistan's economic growth. Awan & Aslam (2017) argued for Pakistan to reduce dependence on foreign loans due to concerns about sovereignty and the ability to choose independent economic and foreign policies. Awan & Aslam (2015) suggested that domestic debt in Pakistan is preferable to foreign debt as it is payable in local currency, allowing the government freedom from external pressures or conditional ties. Mahmoud (2015) studied the impact of external debt on economic growth in Mauritania from 1989 to 2012, using ordinary least squares. The findings showed a significant and negative impact of external debt on economic growth. Mitze and Matz (2015) investigated the relationship between regional public debt levels and economic output in German federal states from 1970 to 2010. The study found an adverse long-term association between regional public debt and per capita GDP. Zaman & Arslan (2014) examined how external debt affects Pakistan's economic growth using GDP as a measure. Their results, based on an OLS regression model from 1980 to 2010, indicated that Gross Capital Formation and External Debt Stock had a significant positive impact on Pakistan's GDP. Shahzad, et al (2014) studied the impact of external debt on economic growth in Pakistan from 1980 to 2013, employing least square multiple regression models. Their findings suggested a significant and negative impact of external debt on economic growth, advocating for debt forgiveness and reliance on FDI.

Ejigayehu (2013) analyzed the effect of external debt on economic growth in eight heavily indebted poor African countries from 1991 to 2010, finding that external debt affects economic growth through the debt crowding out effect. Bökemeier & Greiner (2013) investigated the correlation between public debt and economic growth in seven developed countries from 1970 to 2012. Their study found compelling evidence of a notably negative association between debt and economic growth. Rais & Anwar (2012) focused on how public debt in Pakistan affects economic growth, using OLS and data from 1972 to 2010. The study highlighted the challenges faced by Pakistan and the need to rely on both foreign and domestic sources of capital. Akram (2011) explored the impact of external debt on Pakistan's economic growth from 1985 to 2010. Their results, based on ADF's unit root test, Bound Test, ARDL Model, and Error Correction Model, indicated a negative impact of foreign debt on economic growth in both the short and long term. Schclarek, et al (2005) investigated the correlation between external debt and economic growth in Latin American and Caribbean nations from 1970 to 2002. The study found that countries with lower levels of total external debt experienced higher rates of economic growth, primarily attributed to public external debt levels. Elbadawi, et al (1997) analyzed a sample of 97 developing countries from 1960 to 1995, revealing that the ratio of foreign debt to exports influences economic growth. If the ratio is below 97 percent, an increase in foreign debt facilitates economic growth; beyond that point, economic growth stagnates

Theoretical framework:

It is important to study the relationship between foreign debt and economic growth. To study that how much it is crucial for any nation, but emerging nations in particular need to know exactly what kind of influence foreign debt is having on their economies. The Neoclassical model of economic growth, on which this study is based, holds that foreign debt has a detrimental effect on growth. When a country lends more debt from other countries to cover its spending (budget deficit) and has to pay high interest rates, it makes costly for investor to borrow money. Solow's growth model has been used as a base to investigate the impact of foreign debts on economic growth. According to Solow (1956) neoclassical model, investment is a key for economic growth and for this purpose a country can use its internal and external sources. Internal sources include taxes, fees etc. and external sources includes borrowing money from other countries. The Solow growth model is built on a closed economy which uses labor and capital as means of production.

Under this situation the effects of foreign debt on growth can be viewed by observing the effect of foreign debt on public saving which is used as investment as the Solow model is based on Cobb-Douglas production functions givenas:

$$Y = F(L, AK) \text{ ----------(1)}$$

$$Y = AK^{\propto} L^{1-\propto}$$

According to the debt overhang (DOH) and liquidity constraint (LCH) theories, investment is the primary pathway for the debt-growth relationship. According to the DOH, a nation's massive debt load signals an unstable fiscal environment, which disturb investors and discourages investment. A country faces a liquidity limitation, however, when its responsibility to pay off foreign debt limits the amount of money that can be used to support economic investment. If not, a decrease in current payments for debt service should to follow to an increase in current investment for a specific amount of future loans (Cohen, 1993).

In the base of above statement, we can say that foreign debt is the variable which indirectly affect the economic growth. So, we can write the model as

$$Y=f(K^a, L^b, FD) \text{ ----------(2)}$$

The equation no 2 is used to investigate the nexus between foreign debt and economic growth in both developing and developed countries (Awan & Qasim 2020 and B Senadza, 2018). Similarly, in assessing the economic importance of foreign debt we use the standard Solow model as a benchmark. The above equation is a base to drive the model to quantify the impact of foreign debt, trade openness, gross capital formation and foreign direct investment on the economic growth of Pakistan. The functional form of our model is given below.

GDP is dependent variable while ED, GCF, EXP, IMP, ELF and DS are independent variables. The model is given below.

General form of the model:

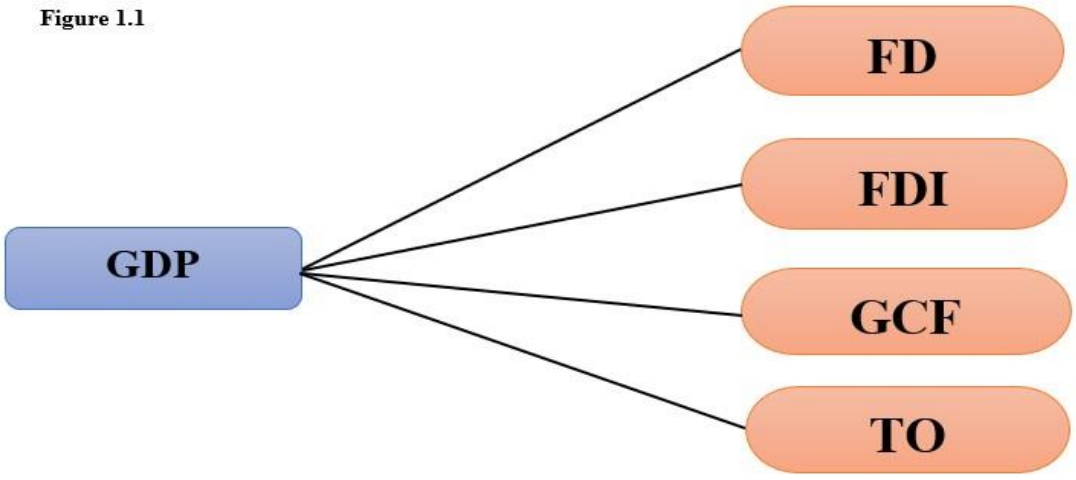
$$Y=f(X1, X2, X3, X4) \text{ ----------(3)}$$

Putting variables in general model:

$$Y= f(FD+FDI+GCF+TO) \text{ ----------(4)}$$

The above equation shows the functional relationship between economic growth, foreign debt, foreign direct investment and trade openness. To understand how theoretically variables are correlated we need to construct a conceptual framework.

Figure 1.1



Variables:

There are four types of variables dependent variables, independent variables, Moderating variables and Mediating variables

Dependent variable:

Gross domestics product (GDP) is our dependent variable.

Independent variable:
Foreign Debt (FD) is our independent variable.
Foreign direct investment (FDI), Gross capital formation (GCF) and Trade openness (TO)
A mediator variable explains the phenomena through which two variables are correlated. Foreign direct investment is mediating variable in this study. When Foreign direct investment increased, it will lead to generate more employment in economy and also increased domestic investment which is further positively contribute to economic growth. Therefore, foreign debt is decreased.

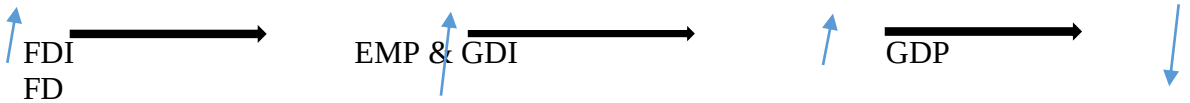
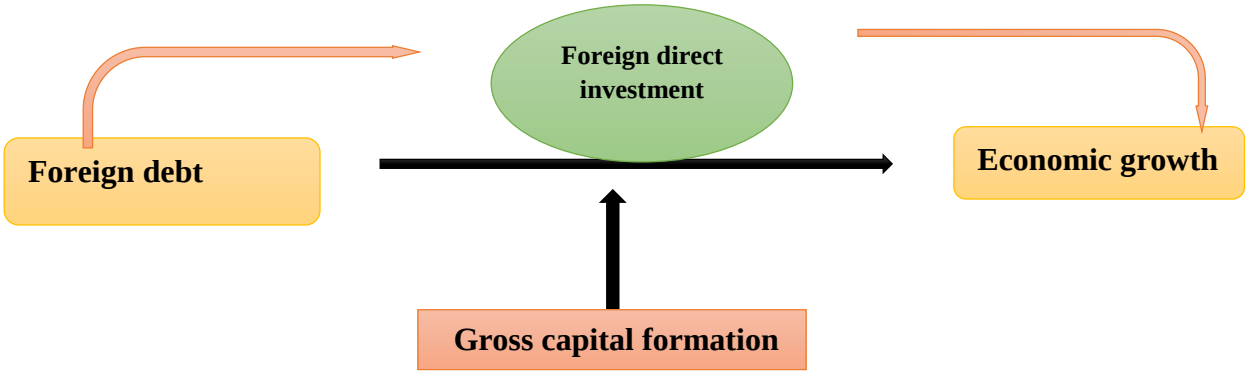


Figure 1.2



Moderate variable affects the strength and direction of the dependent and independent variable. When Gross capital formation increased it led to increase the Gross domestic production (GDP).

Gross capital formation → **Gross domestic production**

Testing hypothesis:

H_o= Foreign debt has no significant effect on Pakistan economic growth.

H_1 = Foreign debt has significant effect on Pakistan economic growth.

Research methodology:

Unit of Analysis:

Unit of analysis of the study is economy of Pakistan.

Data collection and sources:

This research study is a quantitative study based on secondary data and used time series data (1990-2021) which is collected from different sources such as World Development Indicators, Economic Survey of Pakistan, IMF and World Bank, Asian Development Banks etc.

Variable explanation: Table 1

Variables	Definition	Source
GDP per capita (current US$)	GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the	Word development indicator

	products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current U.S. dollars.	
External debt stock (% of GNI)	Total external debt stocks to gross national income. Or Total external debt stocks to gross national income. Total external debt is debt owed to nonresidents repayable in currency, goods, or services. Total external debt is the sum of public, publicly guaranteed, and private nonguaranteed long-term debt, use of IMF credit, and short-term debt.	World Bank, International Debt Statistics.
FDI, net inflows (% of GDP)	FDI is the net inflow of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor.	World Bank Data Base
Gross capital formation (annual % growth)	Annual growth rate of gross capital formation based on constant local currency. Aggregates are based on constant 2015 prices, expressed in U.S. dollars. Gross capital formation (formerly gross domestic investment) consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories.	World Development Indicators
Trade (% of GDP)	Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product.	World Bank national accounts data, and National Accounts data files.

Model specification:

From the above eq no-2, we constructed an empirical model for our study analysis

$$\textbf{GDP per capita}=\beta_0+\beta_1(FD_t)+\beta_2(FDI_t)+\beta_3(GCF_t)+\beta_4(TO_t)+\mu_t \text{ ---------- (05)}$$

Whereas Y, FD, FDI, GCF and TO are per capita income, foreign debt, foreign direct investment, gross capital formation and trade openness. β_0 are intercept ($\beta_1+\beta_2+\beta_3+\beta_4+\beta_5$) are coefficient and U_t are error term.

Now the difference among the variable values causes an outlier effect in the modal to reduce the effect of an outlier in the modal and to elastic the estimation we take the natural log of the regression modal which is as follows;

$$\textbf{LnGDP per capita}=\beta_0+\beta_1 \ln(FD_t)+\beta_2 \ln(FDI_t)+\beta_3 \ln(GCF_t)+\beta_4 \ln(TO_t)+\mu_t \text{ ----------}$$

(06)

This model explains GDP per capita using key economic factors:

- FD (Foreign Debt)
- FDI (Foreign Direct Investment)
- GCF (Gross Capital Formation)
- TO (Trade Openness)

All variables are in log form, and β values show their impact. μt is the error term.

Descriptive statistics:

To provide quantitative descriptions in a format that is reasonable, descriptive statistics are used.

Descriptive statistics are a useful tool for characterizing the behavior of many variables.

Table 2: DescriptiveStatistics

	FD	FDI	GCF	PER_CAPITA INCOME	TO
Mean	39.89989	0.867629	3.712357	5.059744	32.22644
Median	39.89989	0.620823	3.967462	5.038238	32.89710
Maximum	55.90091	3.668323	18.53185	5.227718	38.49932
Minimum	24.34506	0.102667	-9.696390	4.886146	24.70158
Std. Dev.	9.446567	0.770939	6.261635	0.092918	3.676870
Skewness	-0.015031	2.354327	-0.155025	0.077376	-0.407569
Kurtosis	1.773160	8.205762	3.055410	2.191594	2.256093
Jarque-Bera	2.698322	88.27789	0.177736	1.213798	2.181978
Probability	0.259458	0.000000	0.914966	0.545038	0.335884

The above table shows the descriptive statistics of selected variables. The average value of per capita income is 5.05 % for the period under consideration with a standard deviation of 0.09 %. On average, the foreign debt is 39.89 % with a standard deviation of 9.44 %. The mean value of gross capital formation is 3.71 % and trade openness 32.22 % are with a standard deviation is 6.26 % and 3.67%. While the mean value of foreign direct investment is 0.86 % with 0.77% of standard deviation. The maximum value of per capita income is 5.23% while FD, FDI, TO and GCF are 55.90 %, 3.67 %, 38.499 % and 3.667 %. In the bases of Awan & Qasim (2020), Awan & Mukhtar (2019) and Awan & Aslam (2015) studies, we consider the skewness of the variables. In which all variables are little bit skewed. FDD and per capita income are positively skewed while foreign debt, trade openness and gross capital formation are negatively skewed. Kurtosis is a statistical measure that describes the shape of a distribution. It measures how much of the data is concentrated around the mean (Peakness) or spread out (flatness) relative to a normal distribution. If the kurtosis value is less than 3, it means that the distribution is platykurtic, which indicates that the distribution is flatter and more spread out than a normal distribution. In the context of a given table or set of data, if all the variables have kurtosis values less than 3 except foreign direct investment and gross capital formation which value greater than 3 so, it means that all have a flat- and spread-out distribution except foreign direct investment and gross capital formation. Jarque sssBara is a test used to check or to confirm normality and provide joint hypothesis of skewness and kurtosis. This test is non-negative and if it stands for zero then data do not have normal distribution. The results in Table show that foreign debt and per capita income are normally distributed while foreign direct investment, trade openness and gross capital formation are non-normally distribute because of the negative skewness.

Correlation analysis:

The correlation values range from +1 to -1. A value near +1 means a strong positive relationship, while 0 shows no relationship, and values close to -1 indicate a strong negative relationship. Table 2 shows the correlations between the chosen variables.

Table 3: Results of Correlation analysis

	Per Capita Income	**FD**	**FDI**	**GCF**	**TO**
Per capita income	1				
FD	-0.625177	1			
FDI	0.306384	-0.3036895	1		
GCF	0.201666	-0.2115809	0.034137	1	
TO	0.541722	0.4800111	0.190624	0.015506	1

A correlation between per capita income and foreign debt is -0.65 which indicates a moderate to strong negative linear relationship. This suggests that as per capita income decreases, when foreign debt tends to increase, and vice versa. A correlation between per capita income and foreign direct investment is 0.31 which indicates a weak positive linear relationship. This suggests that as foreign direct investment increases, there is a tendency for higher levels of per capita income. A correlation between per capita income and trade openness is 0.54 which suggests a moderate positive linear relationship. This indicates that as trade openness increases, the level of per capita income also tends to increase. A correlation between per capita income and gross capital formation is 0.20 indicates a weak positive linear relationship. This suggests that as gross capital formation increases, there is a tendency for higher levels of per capita income.

ADF's Unit Root Test:

The Augmented Dickey Fuller (ADF) test is a statistical method used to determine if a time series data is stationary or not. Stationary data means that the statistical properties of the distribution, such as mean, variance, and covariance, remain constant over time. The ADF test checks for the presence of a unit root, which implies non-stationarity. If the p-value of the test is less than or equal to 5%, we reject the null hypothesis that a unit root exists and conclude that the series is non-stationary.

Table 4: Results of Augmented Ducky–Fuller unit root tests. (Data used: 1980-2022)

	At Level	At First Difference Variables
	t-statistics (Prob)	t-statistics (Prob)
Per capita Income	-7.02979 (0.000)	----------
FDI	-2.99600 (0.043)	----------
FD	-1.397694 (0.574)	-5.952868 (0.0000)
GCF	-4.268131 (0.001)	----------
TO	-2.395927 (0.1490)	-6.540210 (0.0000)

The Augmented Dickey-Fuller (ADF) test results suggest that per capita income, foreign direct investment (FDI) and gross capital formation (GCF) are stationary at level, as their p-values at level are less than 5% and it is significant while foreign debt (FD) and trade openness (TO) show non-stationarity at the original level because of insignificant p-values which is greater than 5%. However, after taking the first difference, the p-values for the transformed FD and TO become less than 5%, indicating that these variables become significant and stationary.

Residual Diagnostic Tests:

The resulting diagnostic tests explain all measurement errors, containing normality issues, autocorrelation, heteroscedasticity, and misspecification errors. The Jarque–Bera test is used to assess if there is a problem with normality, the heteroscedasticity test is used to check whether the error term is homoscedastic mean constant variance among the error term, the correlation LM test is used to detect the autocorrelation among the error term, and the Ramsey Reset test is used to determine whether the data include any misspecification errors. The residual diagnostic tests are the selected variables given in the below table.

Table 5: Residual Diagnostic Tests

Tests	Value	Prob- Value	Decision
Jarque–Bera Test	0.55	0.76	No normality issue in error term
Heteroscedasticity Test	1.06	0.38	Residual is Homoscedastic
Correlation LM Test	1.98	0.09	No serial correlation
Ramsey RESET Test	2.43	0.12	No misspecification in the error

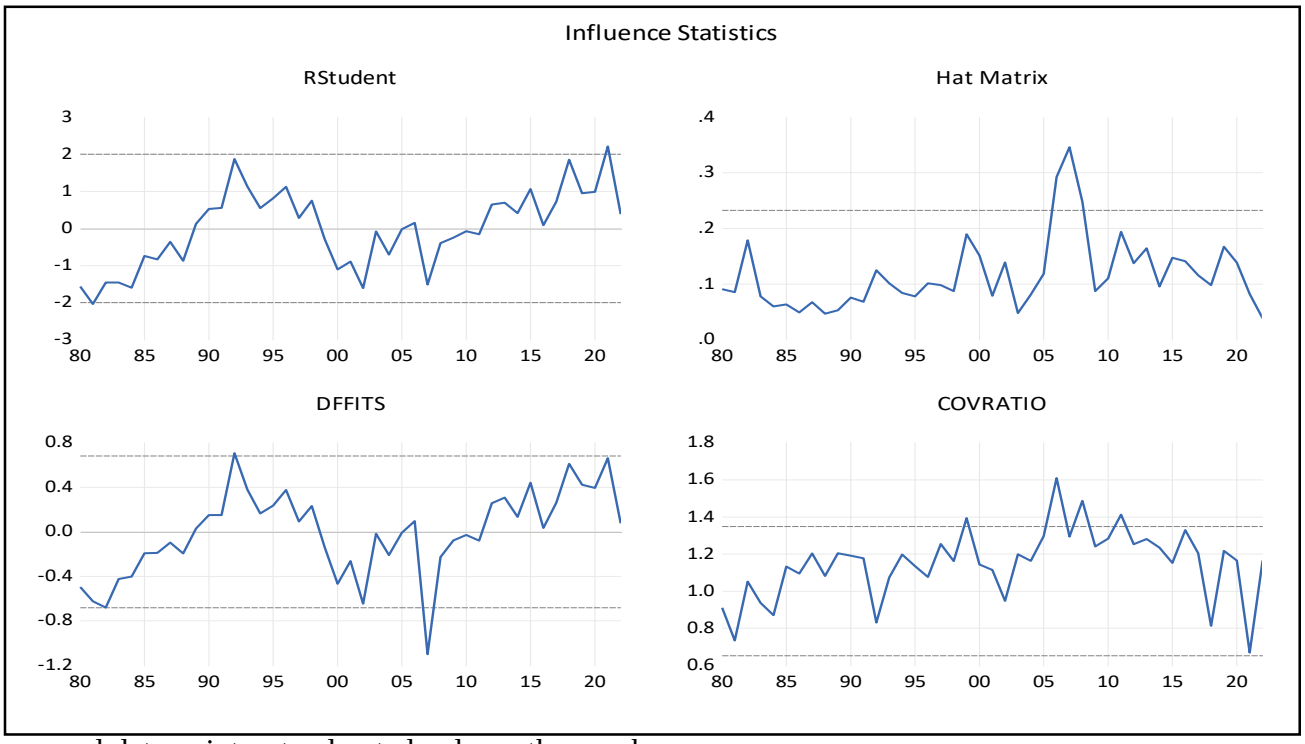
Note: Test specifications checked at a 5% level of significance.

The Jarque-Bera test suggests that the data is likely normally distributed ($p > 0.05$). The Breusch-Pagan-Godfrey test indicates that homoscedasticity is likely present ($p > 0.05$). The LM correlation test finds no evidence of autocorrelation ($p > 0.05$). The Ramsey RESET Test suggests that the data is well-specified, with no indication of misspecification ($p > 0.05$). Overall, the data appears to be normally distributed, homoscedastic, without autocorrelation, and well-specified.

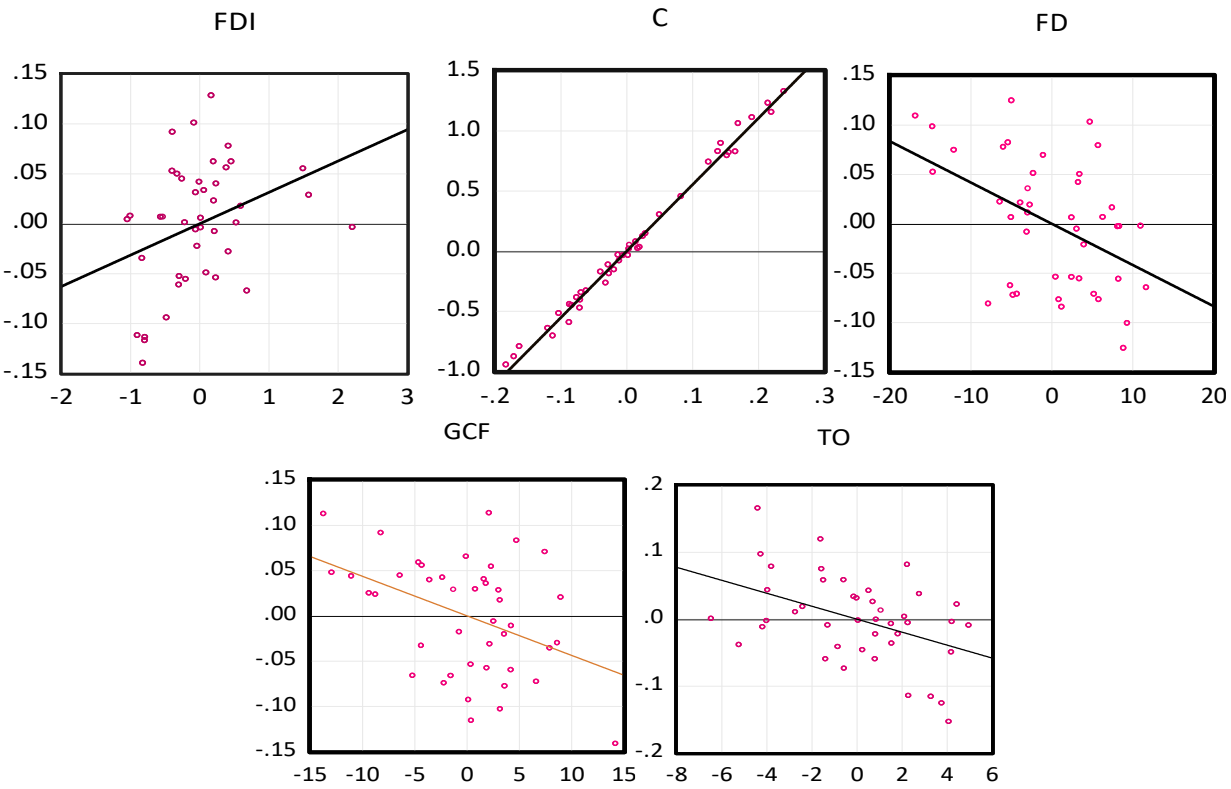
Influence Statistics:

One of the important ways to recognize any outlier or unusual number in the data is through influence statistics.

Figure1: Influence Statistics by RLS Estimation



unusual data points, stand out clearly on the graph.



Leverage plots. Source: Author's estimation. Note: the dependent variable is per capita income, FDI is foreign direct investment percentage of GDP, TO is total trade as a percentage of GDP, GCF is gross capital formation as a percentage of GDP and CPI is a consumer price index for inflation.

There are few irregularities in the data when looking at the correlation between GDP per capita income, Foreign direct investment, gross capital formation, political stability, and inflation. From the above graph, we can easily detect the outliers in the given data with the help of a leverage plot.

Robust least Square Estimation

Variable	Coefficient	Std. Error	z-Statistic	Prob.
GCF	0.004529	0.001671	-2.710852	0.0067
FDI	0.028758	0.015064	1.909087	0.0563
FD	-0.004443	0.001420	-3.128930	0.0018
TO	0.008598	0.003461	-2.484419	0.0130
C	5.506263	0.089241	61.70116	0.0000
	Robust Statistics			
R-squared	0.554761	Adjusted R-squared		0.507894
Rw-squared	0.632215	Adjust Rw-squared		0.632215
Akaike info criterion	42.95486	Schwarz criterion		53.92832
Deviance	0.127483	Scale		0.060247
Rn-squared statistic	50.27077	Prob (Rn-squared stat.)		0.000000
	Non-robust Statistics			
Mean dependent var	5.059744	S.D. dependent var		0.092918
S.E. of regression	0.060936	Sum squared resid		0.141104

Robust regression analysis, the dependent variable is "lnPER_CAPITA_INCOME," and the method used is Robust Least Squares with M-estimation settings. The robust regression aims to

provide more reliable estimates in the presence of outliers or influential data points. The coefficients for each independent variable (GCF, FDI, FD, TO) represent the estimated impact on per capita income. In the given model the p-value of gross capital formation, foreign debt and trade openness are less than 5% which show that they are significant while foreign direct investment is highly significant because the value of Probabilities is closer to 5% in results. The coefficient of trade openness is 0.0085, suggesting a positive impact on per capita income with increased trade openness. When there is one percentage change in trade openness it will change per capita income of 0.85%. The given result also studies by Keho, (2017) that economic growth and trade openness have a positive relationship that is statistically significant at the 5% level of significance. When trade openness rises by 1%, output rises by 0.15% when everything else stays the same. The FDI coefficient is 0.028 %, suggesting a positive impact on per capita income. when their one percent change in FDI it will change 2.8% of per capita income. Siddique et al., (2017) also found a positive relationship between FDI and economic growth in the context of Pakistan. The coefficient of foreign debt is -0.004443, indicating an increasing in foreign debt cause to decrease per capita income. It means that when there is unit percent increase in FD it will decline per capita income of 0.04%. The coefficient of GCF is 0.004529, indicating that a one percent increase in GCF is associated with an increase of 0.04% in per capita income. The similar results of gross capital formation and foreign debt also found by Qasim and Awan, (2020). R squared and Adj. R-squared measure that how much model is explain. The R-squared is 0.554761, indicating that 55% proportion of variability in per capita income explained by the independent variables. The adjusted R-squared considers the number of predictors and it is 0.507894.

Conclusion:

This study aims to explore how foreign debt, foreign direct investment (FDI), trade openness, and gross capital formation interact with economic growth in Pakistan from 1980 to 2022. We used various statistical methods, including descriptive statistics and correlation analysis, along with tests like the Jarque–Bera Test for normality, LM correlation test for autocorrelation, RAMSEY test for data misspecification, and Heteroscedasticity Test for residual homoscedasticity. We also conducted Augmented Dicky–Fuller unit root tests to check the stationarity of the variables. The Jarque-Bera test confirmed that our data follows a normal distribution, the LM correlation test showed no autocorrelation, the RAMSEY test revealed no misspecification, and the heteroscedasticity test indicated homoscedasticity in our samples. The Augmented Dicky–Fuller test demonstrated that some variables are stationary at the level and others at first differences. We used influence and leverage plots to identify outliers in the data and employed robust least square estimation MM technique to eliminate them. The robust estimation results suggest a positive and significant relationship between foreign direct investment, trade openness, gross capital formation, and economic growth. Specifically, FDI has a strong positive and significant association with economic growth. Moreover, the study found that foreign debt has a negative and significant impact on economic growth in Pakistan.

Recommendation:

Fiscal restraint: Reducing foreign debt requires the implementation of sound fiscal policies. To prevent taking on more debt, governments should work to maintain a balanced budget or pursue a fiscal surplus. This can be accomplished by taking steps like cutting back on government expenditure, raising tax revenue, and enhancing public financial openness.

Promote economic growth: Creating a business-friendly atmosphere and putting laws in place to encourage growth can increase income, lower unemployment, and strengthen the nation's ability

to pay back debt. These measures could involve bringing in foreign direct investment, encouraging innovation and entrepreneurship, and making infrastructural investments.

Export expands: A nation might become more susceptible to outside shocks if it depends too much on a small number of export commodities or markets. Diversifying export markets and industries can lower risk and boost foreign exchange profits. In order to encourage non-traditional exports, boost competitiveness, and look into new trade agreements, governments might offer incentives and support.

Strengthen debt management: Reducing foreign debt requires effective debt management. Governments should negotiate attractive interest rates and payback periods, establish cautious borrowing policies, and closely review the terms and conditions of loans. Ensuring responsible debt management can be facilitated by creating a transparent debt monitoring system and formulating a thorough debt management strategy.

Structural reforms: Increasing the economy's productivity and competitiveness through structur al reforms can help lower foreign debt.

Enhancing governance, bolstering the rule of law, lowering corruption, simplifying bureaucracy, and making investments in healthcare and education to develop human capital are a few example s of reforms.

Debt restructuring and negotiation: Governments may think about debt restructuring or credit or negotiation if the burden of foreign debt becomes intolerable.

This may entail asking for debt forgiveness, lowering interest rates, or lengthening payback term.

Boost domestic savings: Increasing domestic savings may help in lowering the need for borrowing from outside sources. Governments can put in place measures to encourage saving, like tax reductions for investments and savings, the creation of effective financial institutions, and raising public financial awareness.

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