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RESEARCH PAPER

Impact of External Debt on Economic Growth of Pakistan: Solow Growth Model Approach

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ABSTRACT

This study aims to analyze the Impact of External Debt on Economic Growth of Pakistan using Solow Growth Model Approach. For this purpose, the timeseries data has been utilized over the period from 1976 to 2021 for Pakistan. Gross Domestic Product have been used as dependent variable, Debt Service, External Debt, Exports, Imports, Gross Capital Formation and Population Growth as independent variables. Ordinary Least Square method investigated the study existence of statistically significant relationship between Gross Domestic Product and Debt Service, External Debt, Exports, Imports, Gross Capital Formation and Population Growth. The results of the OLS analysed that the Debt Service, External Debt, Exports, Import and Gross Capital Formation are contacted and to discuss that they have recommended significantly correlated with dependent variable GDP. The study provides specific evidence to policymakers that increased External Debt on Economic Growth contributes to increased countries economic growth.

KEYWORDS Economic Growth, External Debt, OLS Regression, Timeseries Data

Introduction

For a very long time, Pakistan's biggest problem has been its external debt. Long-term, expensive debt that is difficult for the government, especially the newly elected administration, to repay is considered to be bad to an economy. On the other hand, the government favours it since it can accomplish crucial macroeconomic goals like a good standard of living together with economic development. The objective of ensuring the general wellbeing of the people in emerging countries has not been achieved. Poverty is a recurring issue in emerging countries because of delayed economic development. Consequently, economic progress has been a pipe dream for certain Asian countries. Therefore, collecting foreign debt is mostly done to support social development programmes that will increase living standards. All decision-making levels excluded the impoverished.

A country's capacity to prosper economically has been significantly impacted by the amount of external debt it owes. Since 1980, the external debt of Pakistan, a developing country, has been a significant problem. the major. Pakistan's total loan amount has been financed by the World Bank, the USA, China, and other Western and Arab countries. Additionally, the International Monetary Fund (IMF) has given. For the fiscal years FY21 and FY22, the total debt was PKR 44,336 billion, or 71.3% of GDP. Due to its considerable foreign debt problems, Pakistan, the fifth most populous country in the world, is ranked 59th among borrowers. The nation's debt has increased dramatically since achieving independence because of considerable borrowing, big imports, recurrent currency devaluations, and high borrowing interest rates. However, Pakistan's condition is due to its trade deficit, saving-investment imbalance, and borrowing from both domestic and foreign sources, which is why its debt is so high (Mushtaq, et. al. 2017)

Economic growth and economic development are associated if there are no restrictions on the government moving the growth-based revenues to social development. Because of this, economic growth alone has little effect on social development in the absence of certain ideal circumstances. Neoclassical economists and growth policymakers hold that economic growth is a prerequisite for development. Considerations from politics, society, and culture are crucial in understanding the complex phenomenon of economic growth. Access to natural resources, scientific research, human resources, and technical know-how all have a big impact on economic growth. Conversely, according to classical economists, economic expansion requires labour, capital, raw resources, as well as a certain level of knowledge. These debts are interest-bearing debts.

Asian countries do not lack resources; rather, their failure to effectively use those resources to build and grow the economy is what causes poverty in such countries. Economic success in the Asian area is hampered by instability, fanaticism among many groups, a lack of education, unemployment, trade imbalance, and corruption. These developing countries have long depended on foreign debt to pay for essentials and address budget shortfalls. Unfortunately, this external debt has worsened economic misery rather than promoting regional progress. The primary development aim has been manifestly unsuccessfully achieved by the foreign debt because of its incorrect use and a lack of competent leadership. In the developing world, 14% of people were living in extreme poverty in 2010 compared to 50% in 1990 who made less than $1.25 a day (SDG; UNDP, 2015). 44% of the world's poorest people are youngsters under the age of 14, 65% of them work in agriculture, and 80% of them live in rural regions, according to UNDP (2015). 39% of them lack access to formal education. Additionally, compared to 2.25 percent in Europe and 1.5 percent in Africa, South Asia spends just 0.9% of GDP on social safety nets (Gladieu, 2018).

Pakistan does, however, frequently borrow money in the form of dollars from the IMF, World Bank, Asian Development Bank, United States, and other western and Arab nations. Pakistan is listed as having the 59th highest foreign debt as a borrower. Pakistan is one of the world's most developing nations and is struggling with a large amount of foreign debt. The service of debt consumes around 70% of tax income, with the remaining 30% going to other uses (Mohamed, 2005) Since its founding in 1947, Pakistan's debt has been rising, and it is doing so quickly each year because of significant borrowing and ongoing currency devaluations. Every government has turned to borrowing from abroad despite trying to raise money from within, and this is what is mostly to blame for each nation's high level of debt. Pakistan has taken out loans from both domestic and foreign sources.

Local Debt: As of March 2022, Pakistan's public debt was around PKR 42.9 trillion (USD 248.7 billion), or 80.2% of the country's GDP. Domestic debt was 28.0 trillion Pakistani rupees, while external debt was 14.9 trillion (USD 86.4 billion) (Economic Survey of Pakistan, 2021–2022).

External Debt: The amount of Pakistan's external debt ranged from record lows of 33172 USD million in the third quarter of 2004 to all-time highs of 130632 USD million in the fourth quarter of 2021 (Pakistan's Economic Survey,2021-2022).

Effects of External Debt

Positive effects: It offers access to worldwide markets as well as technology, technical skills, and foreign funding for development.

Negative effects: Because the nation lacks the funds to spend in development projects, the degree of external debt that has accrued over time would hinder economic growth. The debt overhang theory, which claims that a high level of debt inhibits investment and has a negative impact on the economy since it uses up the majority of tax income for repayment, is a justification for this adverse outcome.

Literature Review

The debt Laffer curve, the debt overhang hypothesis, and Solow's new classical model of economic development were all applied in the study, claims Anil Salman (2022). This analysis of the impact of debt on economic development is based on the Solow Neo-Classical Growth Model. Economic development depends on investment, and the economy can use both internal and foreign resources to accomplish this expansion (Solow, 1956). Internal sources include taxes, fees, and a lot more, but external sources, such as the IMF, W.B., and other financial institutions, borrow money from other nations.

Every nation's government occasionally have budget deficits because of high spending and specific incomes. Typically, internal or external borrowing, taxes, exports, and other revenue-generating measures are used. When a government borrows money to make up a budget deficit or increase income, the national economy suffers. A government may borrow money from several sources to meet its financial gaps. While the second requires taking out loans from both internal and external banks, the first way is borrowing money directly from the central bank, which is the same as producing money. Utilizing these resources has an influence on development and growth. (Ali and Irfan, 2020; Imran and Anwar, 2012).

Previous research focused on foreign loans for two reasons: domestic borrowing keeps money in the nation while external borrowing gives an economy access to resources. Simply put, domestic borrowing keeps the money in the same place but in different hands (Keynes, 1929). On the other hand, it is thought that the impact of foreign debt on the economy of developing countries may be both positive and negative. It has a positive impact when the government allocates funds from foreign loans to investment and development initiatives. However, it is harmful to use the earnings from foreign debts for both public and private consumption. While there is no clear evidence of a link between private external debt and growth, there is a negative correlation between public external debt and growth, according to a comparison of external public and private debt. In the case of industrialised countries, a different strategy has been utilised to support the conclusion (Schclarek, 2004).

Ekpe (2020) examines the impact of Nigeria's external debt on the country's economic growth. The paper uses the autoregressive distributed lag technique for the empirical estimate. The study's conclusions point to a weak and positive link between GDP and external debt. However, the ratio of exports to foreign debt is statistically significant, which hurts GDP. The study's findings also demonstrate a long-term link between Nigeria's external debt and its economic growth. Furthermore, the error correction value indicates that 67% of the change in the independent variables will be adjusted for in the dependent variable each month. The Granger Causality test result shows that there is no causal relationship between Nigeria's external debt and economic growth.

Even though they have very different meanings, economic growth and development are occasionally used synonymously. Economic growth is defined as a rise in the average income of a country. Economic development, on the other hand, refers to an increase in people's wellbeing inside the economy. There are differing views on the call for high economic growth objectives. For FY 2022, China said it will focus on real macroeconomic indicators and aim for a gross domestic product growth rate of about 5.5%. Some countries, like Bhutan and China, are against the rise of materialism and are against following the lead of developed countries since doing so will lead to the loss of their traditional values, social structure, and social life. But some have a different viewpoint (Perkins et al., 2006). External debt and poverty are the two main and most interconnected issues that developing countries are currently dealing with in the post-pandemic era. The growth hypothesis claims that these factors have an impact on economic growth both positively and negatively, especially in emerging countries. Because they contribute to budget and payment shortages, external debts are critical (Ashraf et al. 2020).

According to Malik and Siddiqui (2002), Pakistan is one of the biggest consumers of international lending institutions and has the highest debt ratio when compared to other developing countries in its area. Pakistan's government must increase tax revenues because the country has a large ability to pay its debts (Anwar and Chaudhary, 2002). The Pakistani government has imposed a tax on less elastic goods in order to increase tax income under the current system. However, the government must take into mind that the actual income of the poor and public spending is negatively impacted by the tax money gained in this way. This is one of the main reasons Pakistan's populations lacks access to amenities and requirements.

Shah, Ahmad, and Zahid (2005) claim that a sizeable share of Pakistan's resources is used or invested in the defence industry, which lowers the amount spent on production and necessitates the use of optional foreign aid for repayment. External debts must be kept in mind since they are essential for increasing any country's productivity and economic growth (Ali, 2007). According to Awan and Aslam (2015), domestic debt is far preferred than international debt since it is simpler to repay because it is expressed in local currency. Foreign debt, on the other hand, puts the government under strain on both a financial and administrative level. It has been shown that studying how a country's foreign debt impacts its economy reveals that both the short- and long-term consequences are seriously damaging to economic growth (Akram, 2011).

The impacts of Pakistan's foreign debt on economic growth were shown to be detrimental by Mustafa (2012), who looked at both the short- and long-term effects. He advocated for and put emphasis on creating such rules that forbid borrowing from other sources. Foreign debt negatively impacts economic growth significantly, claim Atique and Malik (2012). They claimed that the revenue from exports may be applied to these requirements. Instead, Jafri and Habib (2012) assert that foreign debt may boost a country's level of investment. Awan and Mukhtar (2019), who studied the effects of foreign debts on developing countries, pointed out that these countries have weak governance and should focus on increasing output levels to reduce the level of external debt in their economies. Rais and Anwar (2012) proposed that the countries invest in or utilise their external loans for Pakistan production in several industries, including those linked to health, education, and manufacturing, to boost growth and advancement.

Umar (2014) claims that Pakistan is one of the most indebted countries in South Asia and has not succeeded in creating an ecosystem that would attract foreign direct investment. According to study by Zaman and Arslan (2014), there is a positive correlation between foreign debt and GDP, but it is problematic for an economy when it comes to future debt payments. Asghar (2016) investigated the positive and negative impacts of Pakistan's foreign debt while making a proposal to increase the GDP by improving industrial networks and infrastructure development. When Hussain and Shirin (2016) investigated how the economies of rising countries were impacted by their foreign loans, they found that the relationship between debt and economic growth had become worse.

Hussain et al. (2016) contend that for nations to stabilise and develop, they should improve trade openness, raise, and diversify their exports, and lessen their reliance on foreign debt. Compared to the authors, Daka et al. (2017) employed a different time period. They asserted that only long-term growth is impacted by the debt overhang effect. They also pointed out that, in contrast to external borrowing, which may have a crowding-in effect over considerably longer time periods, the crowding-out impact only occurs over short time periods. Pakistan should be autonomous in both its economic and foreign policy, say Awan and Aslam (2017), to reduce its reliance on external debt.

Theoretical Framework

We briefly touched on the following Solow Neo-Classical Model of Economic Growth hypotheses concerning economic growth: First, the effect of foreign indebtedness on

economic growth has been examined using the framework provided by Solow's growth model. Investment is essential for economic progress, according to Solow (1956), and a nation can employ both internal and foreign resources to achieve this goal. External sources consist of borrowing money from other nations, whereas internal sources are taxes, fees, etc.

The foundation of the Solow growth model is a closed economy that relies on capital and labour for output. Since the Solow model is based on Cobb-Douglas production functions, it is possible to observe the impacts of foreign debt on public saving, which is employed as investment, in this context.: -

Y = F (L, AK)

$$Y = AK^{2} L^{1-\propto}$$

Where

Y = Output

K = Capital input

L = Labor input

A = Technology $\propto$ and 1- $\propto$ are output elasticity of capital and labor respectively

As the technology level A is not an input of production so it is assumed to increase regularly and at constant rate. Similarly, size of labor is affected by population growth (n), so both technology and labor forces are assumed to be exogenous so we will focus on stock of capital K. The change in capital stock is dependent on three factors.

$K' = \delta Y - \delta K$

Where

K' = Change in capital stock

δY = Gross investment

δK = Depreciation of existing capita

Now adding the factor of population growth, we write as: -

$K' = \delta Y - (\delta + n) K$

This equation demonstrates how investment per worker, depreciation per worker, and population growth all affect change in capital per worker. Of these three factors, only investment per worker has a positive relationship with change in capital per worker. Solow deduces from the equation that, if all other factors remain constant, nations with greater rates of savings and investment will eventually amass bigger amounts of capital and create more output per worker.

The Debt Overhang Theory

Krugman created this notion (1988). The notion explains a situation in which a country's debt surpasses its ability to pay it in the future. It is more appropriate to use this idea in underdeveloped nations. This hypothesis postulates that the level of external debt may be so high that all income is diverted to servicing the debt rather than financing new investment initiatives in the debtor nation. Such a predicament is typically brought on by the production gap or the underutilization of resources in the debtor nation. According to Krugman (1988), a greater debt stock alters the advantages of both the creditor and debtor

economies, while debt removal may benefit both. Financial relief is the restructuring of debt obligations to offer the obligated nation various forms of debt relief. These actions include easing the burden on the debtor nation by cutting loan interest rates, lowering principal balances, and changing loan terms.

Material and Methods

Data and Source

Type of data being used in this study is secondary that will be collected from different sources such as World Development Indicators, Economic Survey of Pakistan and World Bank, Asian Development Bank etc. The sampling period of our study is spread over from 1976 to 2021.

Table 1
Variables and Data Source

Variables	Description	Data Source
GDP	GDP (current US$)	WDI
Debt Service	Debt service on external debt, total (TDS, current US$)	WDI
External Debt	Debt service (PPG and IMF only, % of exports of goods, services, and primary income)	WDI
Exports	Imports of goods and services (% of GDP)	WDI
Imports	Exports of goods and services (% of GDP)	WDI
Gross Capital Formation	Gross capital formation (current US$)	WDI
Population Growth	Population growth (annual %)	WDI

Econometric Model

The study main interest is to define and estimate a basic type of functional model of Impact of External Debt on Economic Growth of Pakistan: Solow Growth Model Approach. By estimating the equation 1 below.

Equation 1

$$GDP = \alpha_0 + \beta_t DS + \beta_t ED + \beta_t E + \beta_t I + \beta_t GCF + \beta_t P + \varepsilon ______ \textbf{Eq1}$$

Ordinary Least Squares regression (OLS) is a common technique for estimating coefficients of linear regression equations which describe the relationship between one or more independent quantitative variables and a dependent variable (simple or multiple linear regression).

Results and Discussion

In this section, timeseries data analysed to generated results and interpretation in a comprehensive method. Firstly, the study descriptive statistics for showing data summary or overview; secondly, the study run Ordinary Least Square Method.

Descriptive Statistics

Present the number of observations (N) and the summary statistics (Mean, Median, Maximum, Minimum, and Standard Deviation) for all variables that have used in empirical analysis. This data set includes 46 observations for all the variables. Data is consisting of forty-six years of annual observations for the period from 1976 to 2021.

Table 2
Descriptive Statistics

	GDP	Debt Service	External Debt	Exports	Imports	Gross Capital Formation	Population Growth
Mean	1.19E+11	22.0231	3.22E+09	12.87931	19.14724	1.96E+10	2.641376
Median	6.31E+10	22.74462	2.88E+09	13.0249	19.42409	1.16E+10	2.754583
Max	3.56E+11	36.01789	1.10E+10	17.27073	23.3061	6.08E+10	3.363952
Mini	1.32E+10	7.903826	3.86E+08	8.221612	13.24388	2.30E+09	1.931319
Std. Dev	1.07E+11	7.741407	2.33E+09	2.513214	2.554837	1.65E+10	0.464624
Obs	46	46	46	46	46	46	46

Std. dev. 5 = Very Good, 4 = Good, 3 = Average, 2 = Poor, 1 = Very Poor

The table above includes statistical data and A low standard deviation implies that the data are grouped around the mean, whereas a large standard deviation shows that the data are more dispersed. In contrast, a high or low standard deviation implies that data points are, respectively, above or below the mean, whereas a standard deviation that is near to zero suggests that data points are close to the mean. The dependent variable of the research, GDP, has a mean value with a wide range and a low standard deviation, which indicates that data are centered around the mean. However, debt services have a greater standard deviation value.

Ordinary Least Square Method

This study utilizes ordinary least square model. The results show that all variables for have a very high explanatory capacity with more than 99 percent (R Square) of the dependent variable variance explained by the independent variables. This can be seen from R-squared and adjusted R-square.

Table 3
Ordinary Least Square Method

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Debt Service	-2.90E+08	5.63E+08	-0.51524	0.0093
External Debt	5.937331	2.530272	2.346518	0.0241
Exports	-2.47E+09	1.01E+09	-2.43569	0.0195
Imports	-1.31E+08	8.48E+08	-0.15416	0.0783
Gross Capital Formation	5.329368	0.397575	13.40469	0.0000
Population Growth	-6.83E+09	1.56E+10	-0.43907	0.6630
R-squared	0.990	Mean dependent var		1.190
Adjusted R-squared	0.989	S.D. dependent var		1.070
S.E. of regression	1.110	Akaike info criterion		49.245
Sum squared resid	4.840	Schwarz criterion		49.523
Log likelihood	-1125.65	Hannan-Quinn criter.		49.349
F-statistic	683.928	Durbin-Watson stat		2.817
Prob(F-statistic)	0.000			

Dependent Variable: GDP
Sample: 1976 2021
Included observations: 46

Results of the Ordinary Least Squares Method are shown in Table 3. The debt service, external debt, exports, imports, and gross capital formation are contacted to discuss their recommendations that the dependent variable GDP be substantially linked with these variables. The total importance of the regression is shown by Prob F. Unlike the t-statistic, which examines significant level for individual variables, this evaluates significance level for all variables collectively. This has "all the regression coefficients equal to zero" as the null hypothesis. The likelihood that the null hypothesis is correct is shown by Prob F. According

to the findings, the likelihood is almost negligible (0.000). This suggests that the regressions are significant overall.

The percentage change in the dependent variable caused by a one-unit increase in the independent variable is represented by the coefficient values. The Coefficient values of External Debt and Gross Capital Formation, respectively, representing positive change the percentage in the dependent variable with the increase by one unit in the independent variable, allow the researcher to decide on the acceptance or rejection of hypotheses with significance values less than.05. Our dependent variable GDP is highly impacted by the prob value of debt service, external debt, exports, imports, and gross capital formation.

Findings

We will now go through the findings of an empirical examination of the factors affecting Pakistan's GDP using time series data spanning 46 years, from 1976 to 2021. To examine the relationship between the dependent variable and the independent variables, the Ordinary Least Square Model was utilised. Below are listed each independent variable's influence on the economy:

The factors influencing Pakistan's economic growth are listed below. These are independent variables, whereas the dependent variable in this model is GDP economic growth. Our findings demonstrate that Pakistan's external debt, which is often repaid with foreign currency, has a detrimental impact on both the long-term and short-term economic growth of Pakistan. Because they make up a significant portion of aggregate demand, exports are positively correlated with economic growth in any nation. It contributes to rising total demand and supports faster economic expansion. We discovered that exports contribute favourably to economic growth both immediately and over the long term. When a country's exports surpass its imports, it indicates it produces more than it consumes, and the balance of commerce is defined as exports minus imports. However, the balance of payments is typically negative in developing nations like Pakistan since our consumption exceeds our produce. Our imports outnumber our exports. Because of this, we must pay more than we make. Imports, in accordance with our findings, have a detrimental impact on Pakistan's economic development. Investments, infrastructural improvements, and technological advancements are all included in a country's gross capital formation. Capital formation is crucial for a nation's prosperity. In this study, we discovered that gross capital creation has a favourable impact on Pakistan's economy, and we argue that gross capital formation is essential for economic progress. The employed work force is essential to the growth of an economy. High employment opportunities will lead to rapid economic development in a nation. Our findings show a significant relationship between productivity and labour force. The total amount needed to repay interest and principal on debt for a set period is known as debt servicing. Pakistan is in the worse condition since payments are made in foreign currency there. Our research' findings indicate that debt servicing has a detrimental effect on Pakistan's economic expansion.

Conclusions

The findings lead us to the conclusion that there is a negative link between external debt and economic growth since paying off debt requires significant amounts of money, and the quantity of debt slows down economic growth and increases a country's reliance on foreign resources. The lending nations and donor organisations place strict conditional ties on the borrowing nation and lend money while keeping in mind their political and strategic goals. Foreign loans do speed up growth and help close the twin deficits, but they can also lead to a variety of other issues if they are misused for unscrupulous or unproductive purposes. Pakistan's large foreign debt limits its ability to operate freely on an economic and international level and prevents it from making autonomous decisions. As a result, it is essential to employ foreign loans for productive purposes and to borrow money with as few conditions as possible.

Recommendations

The advice that follows can help GDP increase considering this research. The Pakistani government should adopt constructive initiatives to raise GDP rather than only relying on external debt. The two fundamental factors that increase GDP are capital formation and exports. The government ought to support private investment. Some potential sectors may receive subsidies for this reason. To lessen the burden on the economy and maintain exchange rate stability, the government should choose to use low-interest, long-term foreign funding. The government should stop wasting resources, end corruption, and boost production. The agricultural sector must be encouraged to increase production by choosing cutting-edge equipment and crops. To mobilize more resources, the tax base must be increased. Financial incentives must be used to promote entrepreneurship in the nation to lessen pressure on the government to fill jobs for the educated labour force that is jobless. To encourage overseas Pakistan to invest in Pakistan rather than putting their money in foreign banks or in other nations, incentives and security must be offered.

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