

Does External Debt Being a New Factor of Fiscal Policy Influence a Long-Term Income-Inequality in Pakistan?

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ABSTRACT

One of the most important and difficult economic variables that slow down a nation's economic progress is external debt. An economy where the wealth disparity between rich and poor is considerable will be significantly impacted by debt. A crucial macroeconomic measure of an economy that explains the equitable allocation and distribution of resources among the masses is the GINI index of any nation. The UN SDGs' ultimate objective is to reduce income inequality among the general population of the world's countries. By considering the debt to GDP ratio, this study studies the effect of debt burden and its extensive effects on the inequality of Pakistan's residents. The most popular method of generating income for debt repayment is taxation. The ARDL model is used in this work to investigate the short- and long-term estimations of the debt-inequality nexus. The study concludes that debt raises the burden on the general public in the form of high taxes, and as a result, an increase in the tax-to-GDP ratio causes Pakistan's inequality index to rise. Despite the reliance on internal fund collection in the form of a tax, the study proposes opening up international trade and domestic industry to increase the revenue inflow.

1 Introduction

The developing world is currently dealing with two significant, interconnected issues: high levels of debt and growing disparities between the rich and the poor. The development of the economy is significantly impacted by both of these problems. Regarding the transmission processes between foreign debt and income inequality, the conventional theoretical models are found to be quiet. Similar to this, a small empirical study examines the effects of debt on income distribution and economic well-being. Although this problem and its effects on economic growth are discussed in both theoretical and empirical literature, there is not always an explicit connection made to the distributional effects of growth. However, it is believed that economic prosperity creates opportunities for reducing poverty. Inextricably linked to the sustainability issue of external debt is the debt-poverty nexus. Debt sustainability conditions, in general, describe a situation where a country can meet its debt obligations.

External debt does, however, also have certain counter effects on investment and economic expansion in a country especially in developing nations. The "debt overhang" argument, which broadly justifies

these effects, contends that if an economy's future debt is likely to exceed its ability to repay it, the expected cost of debt-servicing will inhibit investment (Krugman, 1988). If foreign money is utilized to pay down the debt, fewer resources will be available to finance investment-led growth, hence a crowding out effect is reflected. Summarizing the argument, the extent of external debt is a critical economic indicator that affect the overall economic prospects of the country. Pakistan is struggling a high level of external debt for years after its independence, this led to the concerns regarding its long-term economic growth prospects. By examining the relationship between external debt and income inequality, this study shed light on the potential impact of the debt burden on the distribution of income in Pakistan. There is an extensive research on the debt-economic growth nexus, but little research is carried out on the relationship between external debt and its outcome as un-equal distribution of income explained by Max Lorenz in 1905. By focusing specifically on income inequality as an outcome variable, this study provides a new perspective on the impact of external debt on the income inequality in Pakistan. In addition, this is a value addition to the existing literature on the determinants of income inequality as well which is fruitful to devise more effective policy decision by the authorities.

2 Literature Review

Policymakers in Pakistan must prioritize understanding the complex relationships between the burden of external debt and income inequality. The complex character of this relationship and its consequences for socio-economic dynamics are highlighted by a thorough analysis of the literature like Akram (2013) signifies a positive significant impact of increase in the debt upon increasing the level of inequality for developing countries followed by Fosu (2007) and Woo (2011). Their study find a debt hurt economic growth. Their study is based on the overlap generation model recommends that gain and loss of the external debt are unfairly distributed and the majority of growth's benefits are reaped by the future generation. Baglan and Yoldas (2016) find that the current generation bears the external debt taken in the previous years as the outcome of trickledown effect. The term "Debt Laffer Curve" has gained popularity in economic literature, suggesting that there is a lot of theoretical and empirical discussions about the relationship between debt and economic growth. However, there is growing agreement that the nature of this relationship depends on the quantity of debt. The study determines this study is to determine whether there is a non-linear relationship between public debt and long-term economic development. In particular, the author wants to know if there is a well-defined "laffer curve" pattern, in which debt positively affects growth up to a certain degree and then starts to have an adverse effect. Since the traditional economic theory holds that a cumulative demand encourages demand and supply through public spending and has a multiplier effect, fiscal policy's effectiveness defies this idea. The crowding-out impact of fiscal policy theory contends that in the absence of private sector spending, increased public spending is necessary to increase demand and consumption during economic downturns (Yang et al. 2021). However, some Keynesian demonstrate how public spending can displace private sector demand and ultimately have a negative effect on productivity in open economies due to interest rate fluctuations (Hlongwane et al. 2021). Additionally, a fiscal strategy that promotes borrowing for growth results in decreased private investment due to increased interest rates (Makohon and Adamenko 2020). Public debt negatively affects inequality in the Euro Area and the Asia-Pacific region, according to Sakkas and Varthalitis (2021) and Tung (2020), respectively. These findings suggest that governments might use public debt as a strategy to lessen inequality. On the other hand, Akram and Hamid (2016) separate the effects of internal and external debt. According to their findings, only internal debt reduces inequality; foreign debt has no appreciable effect. Furthermore, the study finds no statistically significant difference between how South Asian economies' wealthy and poor citizens are affected by external debt. In conclusion, the literature demonstrates the nuanced connection between Pakistan's external debt and income disparity. Even while some studies hint at a possible adverse effect of external debt on income distribution, further research is necessary to fully comprehend the mechanisms and dynamics at work. Addressing the problems brought on by the burden of external debt and its effects on income

inequality continues to be a crucial concern for policymakers in Pakistan, necessitating further research and evidence-based policy responses.

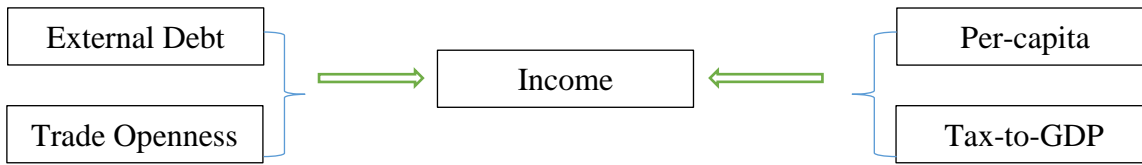


Figure 1
Conceptual Framework

3 Data and Methodology

The study's dependent variable is the income inequality index (GINI), and the explanatory variables are external debt (ED), trade openness (TOP), the tax-to-GDP ratio (T/Y), and per-capita income (the Auto, regressive distributive lag model is employed in this work to produce effective results). The model includes a dummy variable (DM) to account for Pakistan's pre- and post-IMF program, which accounts for a sizable portion of its external debt. The data is taken from World development indicators for the period 2016-2020.

We plan to apply an autoregressive distributive lag model based on the initial unit root test. A form of least squares regression known as ARDL incorporates the lags of the independent and dependent variables into a description. In a single-equation framework, autoregressive distributed lag (ARDL) models are often employed to analyze dynamic relationships using time series data. The variable's realization and autoregressive part, as well as the present and past values of other explanatory variables, might all have an impact on the variable's current value when it is regressed. You can use either stationary or non-stationary variables, or you can mix the two. The ARDL model is used to discriminate between long- and short-term effects as well as to test for co-integration, or whether the key variables under investigation have a long-term relationship. The ARDL equation is as follows;

$$\begin{aligned}
 GINI = & \beta_0 + \sum_{i=0}^n \beta_1 \Delta GINI_{t-y} + \sum_{i=0}^m \beta_2 \Delta ED_{t-y} + \sum_{i=0}^K \beta_3 \Delta TOP_{t-y} + \sum_{i=0}^K \beta_3 \Delta Z_{t-y} \\
 & + \sum_{i=0}^p \beta_5 \Delta Yg_{t-y} + \beta_6 DM_t + \beta_7 GINI_{t-y} + \beta_8 ED_{t-y} + \beta_9 TOP_{t-y} + \beta_{10} Yg_{t-y} \\
 & + \beta_{11} t/y_{t-y} + \lambda ECT(-1) + \mu \dots \dots \dots (1)
 \end{aligned}$$

Equation (1) shows the external debt as *ED*. The GINI coefficient measures income inequality. *TOP* denotes trade openness, while *Y_g* is Pakistan's GDP per capital growth. It is assumed that the error term is normally distributed. The elasticity of the GINI index about external debt (*ED*), trade openness (*TOP*), and dummy variable is represented by the coefficients 1, 2, 3, and 4, respectively (*DM*).

4 Empirical Findings

4.1 Unit-Root

If a time series variable is stationary and has a unit root, it can be determined using a unit root test. ARDL can only estimate variables that have no unit root at I (0), I (1), or both, as has already been mentioned. This implies that variables that are stationary at level or first difference can only be estimated. However, as it goes against the bound testing assumption, ARDL (Pesaran et al., 2001) cannot be employed if variables are stable or have no unit root at I (2). The null hypothesis is that there is a unit root, while the alternative hypothesis is that there is none. To find out if there is a unit root, we utilize the Augmented Dickey-Fuller test (ADF). The expanded Dickey-Fuller test considers

the negative values. The null hypothesis will almost certainly be rejected at whatever level of significance if the value of the t state is negative.

Table 1
Unit Root Results

Variables	ADF Test		P-P Test	
	(level)	(1 st Difference)	(level)	(1 st Difference)
GINI	0.070*	0.000***	0.071*	0.000***
ED	0.316	0.023**	0.541	0.007***
TOP	0.137	0.000***	0.191	0.000***
Yg	0.712	0.037**	0.997	0.199
Z	0.083***	0.001***	0.360	0.001***

The aforementioned table displays the results of the unit root test. To determine the significance of the data, we applied the Augmented Dickey-Fuller Test (ADF) and the Phillips Perron Test (PPT). The GINI (coefficient of income inequality) was stationary at a level and significant at 10%, as well as stationary at the first difference and significant at 1%. The first difference of external debt (Ed) is stationary. ED is significant in the ADF test at 5%, and in the PPT test at 1%. Trade openness (TOP) is stationary at the 1% test level and substantial level difference. In the ADF test, the GDP per capita (yg) is stationary at the first difference, and the level of significance is 5%. The ratio of taxes to GDP (T/Y) is steady at the first difference and becomes significant at 1%.

4.2 Bound Test

Pesaran and Shin (2001) devised the ARDL bound test as a technique to assess whether a long-term link exists between the variables. To ascertain whether there is a long-term co-integration relationship among the variables, the bound test is applied that employs the following hypothesis;

$H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 = 0$ alternative to;

$H_1: \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 \neq 0$,

Table, the lower and upper limit values for a lag of order 1 are 4.94 and 5.73, respectively, at the 95 % significant level. The estimated F-statistic (8.99) is larger than the upper bound value, which shows that the null hypothesis that there is no long-run correlation is rejected. As a result, it shows a long-term link between the variables. The Table of Pesaran and Shin (1995) is used to determine the lower limit value and upper limit values at a 95 percent confidence interval for the F-statistic.

Table 2
Bound Test Results

Significance	Lower bound	Upper bound
10%	2.20	3.09
5%	2.56	3.49
2.5%	2.88	3.87
1%	3.29	4.37
F-statistic	8.99	

4.3 Estimates of ARDL and Error Correction Model

According to Table 5, ED in Pakistan is a statistically significant driver of income inequality (GINI). At a 1% level of significance, the impact of ED on GINI is statistically significant. According to the ED coefficient (0.126), an increase in ED of 0.126 over time causes an increase in income inequality of above 0.1. Another important aspect of Pakistan's economic inequality is the country's openness to trade. Because trade openness hurts income inequality, a 1% increase in trade openness results in a 9.5% reduction in income disparity. Another element that influences income disparity is GDP per capita. GDP per capita in Pakistan is significant at 5%, and as GDP per capita rises, income inequality in Pakistan also rises. Income disparity is impacted by the tax-to-GDP ratio. At a 1% level of

significance, T/Y is significant. DM is a dummy variable with a 5% significance level that indicates structural change during the year 2018.

The short-run findings indicate that income disparity is significant in the short term at 1%. According to its coefficient, a GINI score of 1 results in a 90% change in the dependent variable. The probability value of ED is low in the near term, which suggests that ED affects the dependent variable. The lag value of foreign debt demonstrates that income disparity is also impacted by debt from the prior year. Another control variable that has a detrimental impact on income disparity is trade openness. This implies that for every 1% increase in trade openness, income inequality is reduced by 26%.

Trade from the previous year also had a detrimental impact on income inequality in the current year. While the short-term impact of GDP per capita on income inequality is negative and considerable, the long-term impact of GDP per capita is positive and significant, as evidenced by the lag value. Income disparity is also positively impacted by the tax-to-GDP ratio. It indicates that Pakistan's income disparity is getting worse as the tax share of GDP rises. The dummy variable displays the structural break marking the year 2018 for a socio-political change in the country.

Table 3
Long Run Estimates of ARDL

Variable	Coefficient	P-Value
ED	0.121	0.002
TOP	-0.095	0.077
Y _g	0.389	0.019
T/Y	0.951	0.001
DM	0.231	0.003
C	25.39	0.120
Short Run Estimates of ARDL		
Variable	Coefficient	P-value
Δ(GINI(-1))	0.946	0.001
Δ (ED)	0.057	0.017
Δ (ED(-1))	0.133	0.084
Δ (TOP)	-0.263	0.001
Δ (TOP(-1))	-0.119	0.081
D (Y _g)	-0.056	0.030
Δ (Y _g (-1))	0.704	0.040
Δ (Z)	0.732	0.001
Δ(Z(-1))	0.654	0.030
DM	0.562	0.035
ECM (-1)	-1.899	0.000

4.4 Tests for Stability

To validate the structural stability of the study's chosen model, Brown et al. suggested two tests; the cumulative sum of the recursive residual test (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMSQ). To check the stability of the chosen ARDL based on the error correction model, The CUSUM and CUSUMSQ graphs are displayed in Figures 3 and 4, respectively. Both plots remain inside critical limits at a 5% level of significance, which leads us to conclude that the model is fundamentally stable in the long run.

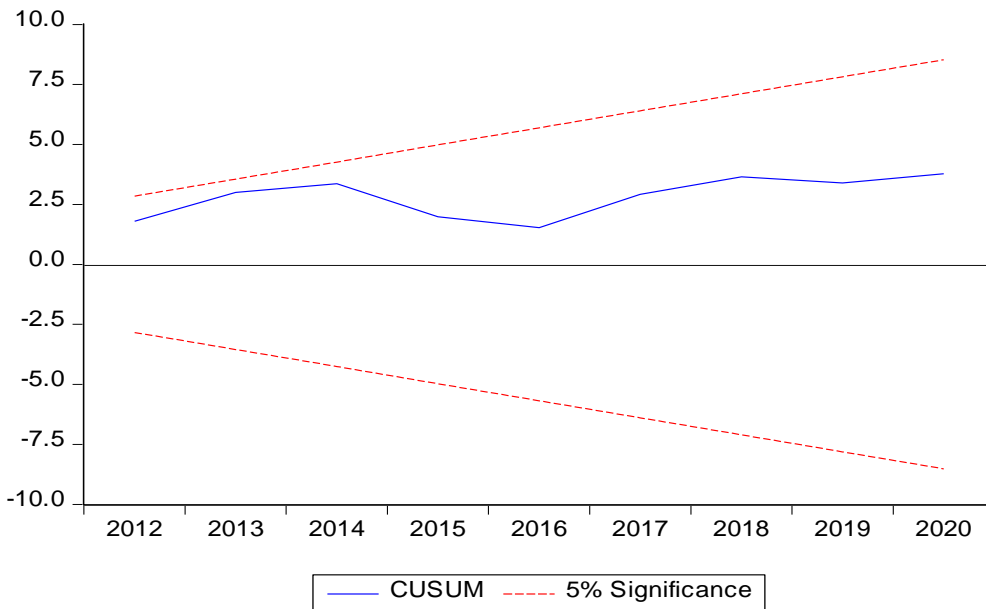


Figure 2
CUSUM

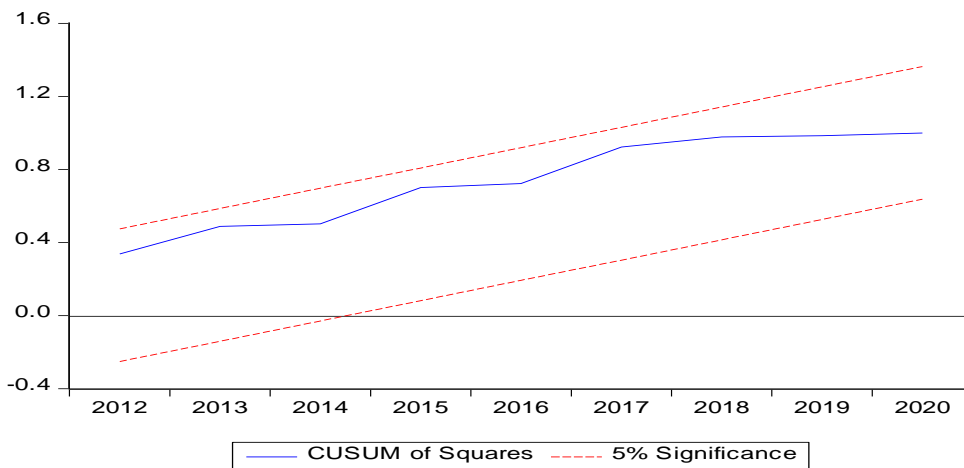


Figure 3
CUSUMSQR

4.5 Vector Relationships

The Granger causality test is used to examine the direction of short-run causality between pay disparity external responsibilities, exchange responsiveness Gross Domestic Product Per Capita, and Duty into Gross Domestic Product Proportion. According to the table, there is bi-directional causality between external debt and income inequality. Similarly, there exists a bi-directional causality running between trade openness and income inequality in Pakistan however there exists a unidirectional causality running between income inequality to national income, trade openness, and external debt. A bi-directional causal relationship exists between tax-to-GDP and trade openness and change in National income.

Table 4
Granger Causality Test

Causation	F-statistic	P-value	Outcome
$\Delta ED \rightarrow \Delta GINI$	0.309	0.038	Two-way causality
$\Delta GINI \rightarrow \Delta ED$	0.388	0.023	
$\Delta TOP \rightarrow \Delta GINI$	0.388	0.048	Two-way causality
$\Delta GINI \rightarrow \Delta TOP$	0.447	0.001	
$\Delta GINI \rightarrow \Delta Y_g$	1.403	0.271	One-way causality
$\Delta Y_g \rightarrow \Delta GINI$	0.029	0.060	
$\Delta T/Y \rightarrow \Delta GINI$	0.308	0.038	One-way causality
$\Delta GINI \rightarrow \Delta T/Y$	0.158	0.854	
$\Delta TOP \rightarrow \Delta ED$	0.028	0.048	One-way causality
$\Delta ED \rightarrow \Delta TOP$	1.436	0.264	
$\Delta Y_g \rightarrow \Delta ED$	0.233	0.794	One-way causality
$\Delta ED \rightarrow \Delta Y_g$	1.122	0.004	
$\Delta T/Y \rightarrow \Delta ED$	2.358	0.123	One-way causality
$\Delta ED \rightarrow \Delta T/Y$	0.154	0.017	
$\Delta TOP \rightarrow \Delta Y_g$	1.283	0.001	One-way causality
$\Delta Y_g \rightarrow \Delta TOP$	1.299	0.297	
$\Delta T/Y \rightarrow \Delta TOP$	0.975	0.009	Two-way causality
$\Delta TOP \rightarrow \Delta T/Y$	0.218	0.006	
$\Delta Y_g \rightarrow \Delta T/Y$	3.986	0.036	Two-way causality
$\Delta T/Y \rightarrow \Delta Y_g$	9.122	0.001	

5 Conclusion and Policy Recommendation

5.1 Conclusion of the Study

In this study, we investigate the role of income inequality in examining both long-run and short-run causal links between external debt, trade openness, GDP per capita, and tax-to-GDP ratio. In this study, the years 1996 to 2020 were used to examine the connections between income inequality, external debt, trade openness, GDP per capita, and the ratio of tax to GDP. Dummy variables were also used to determine whether there was a structural break in the outcome variable, income inequality. The dummy results reveal important structural disparities in the relationship between debt and inequality since after the fiscal year 2018, Pakistan's inequality coefficient increased relative to its debt load. Therefore, it is established that Pakistan's debt problem worsens wealth disparity throughout the nation. The tax-to-GDP ratio is the subject of useful information. The tax-to-GDP ratio and the coefficient of income inequality are found to be positively correlated in this study. In Pakistan, income inequality among the population arises when taxes are imposed above an individual's ability to pay. Therefore, it is advised to maintain a low tax burden and a large tax base. The burden on taxpayers is increased by higher prices and lower productivity when taxes as a percentage of GDP rise. This analysis concludes that a higher tax-to-GDP ratio raises the inequality index. This study likewise concluded that increased commerce would raise demand for the country's products, which would lead to increased output, higher prices, and an improvement in living standards.

5.2 Policy Recommendations:

1. Reduce external debt levels: Reducing external debt levels can help to reduce the vulnerability of the Pakistani economy to external shocks and can help to promote long-term economic stability. To achieve this, the government may need to adopt measures such as reducing non-essential imports, attracting foreign investment, and promoting export-oriented industries.

2. Adopt a more effective fiscal policy: Fiscal policy can play an important role in mitigating the negative effects of external debt on income inequality. The government should consider adopting a more effective fiscal policy that prioritizes social spending on education, healthcare, and social safety nets to reduce inequality.
3. Improve tax collection and administration: Pakistan has one of the lowest tax-to-GDP ratios in the world, which limits the government's ability to generate revenue to finance public goods and services. The government should focus on improving tax collection and administration to increase revenue, reduce the budget deficit, and promote long-term economic stability.
4. Promote inclusive growth: The government should promote inclusive growth by encouraging investment in sectors that have the potential to create employment opportunities and raise incomes for low-income households. This could include investments in infrastructure, agriculture, and small and medium-sized enterprises.
5. Strengthen social safety nets: To address the immediate needs of the most vulnerable segments of society, the government should strengthen social safety nets. This could include expanding the coverage of social protection programs such as the Benazir Income Support Program and introducing new programs to target the most vulnerable households.

In addition to these policy recommendations, decision-makers in Pakistan should also consider implementing policies that promote transparency, accountability, and good governance. This could include measures to combat corruption, promote transparency in public procurement, and strengthen the rule of law. These policies are essential for building public trust in government institutions and promoting sustainable long-term economic growth.

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