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MACROECONOMICS DETERMINANTS OF GOVERNMENT DEBT AND THRESHOLD EFFECT OF DEBT ON ECONOMIC GROWTH IN SOUTH ASIA: A PANEL ANALYSIS

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Abstract. Identifying the specific problems confronting the communities of South Asia in the wider sense of debt are the key concerns that need to be tackled in potential efforts in the area. This study offers the econometrics investigation of the macroeconomic determinants of government debt by using Fixed Effect Regression Model and analyze whether there is threshold level for the efficacy of debt in South Asian economies by using Fixed-Effect Panel Threshold Model offered by (Hansen, 1999) from 2008-2018 using secondary panel data. The results reveal that inflation, exchange rate and total investment are major determinants of government debt level in South Asia. Government expenditure and trade openness have negative effect on government debt level, and the results of Threshold Model reveal the calculated threshold value of government debt level is 16.24 beyond this value the increase in government debt level would be harmful for economic growth for South Asian economies.

Keywords: Threshold, Debt Laffer curve, Government Debt, Economic Growth

JEL Classification: E0, O47, O50

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I. INTRODUCTION

Sustainable Economic Growth is the key focus of economic policies in developing nations. The accomplishment of this goal demands large quantities of financial resources must be diverting towards the growth of infrastructure and productive capability. Economist believes that nations with high capital accumulation can achieve faster Economic Growth than the nations with low capital accumulation, because capital is most effective driver for productivity (Hey, 1972). Unfortunately, most of the developing nations don't have enough financial resources to achieve their high Economic Growth goals. This is partially due the low-level domestic savings and investment, limited productivity and high consumption trends, therefore the government look towards external financial resources to support domestic savings and to invest in infrastructural projects and organizational superstructures was deemed necessary to achieve accelerated Economic Growth (Aluko F, 2010)

Debt may be advantageous for nations, particularly for developing nations with significant development problems, if it is utilized to fund growth-enhancing expenditures in sectors such as infrastructure, health care, and education. Government debt buildup can also be used briefly as part of counter-cyclical fiscal policy to stimulate demand and activity during economic downturns. Borrowing can help consumers moderate their spending and companiesinvest in the private sector. However, excessive debt poses considerable dangers, particularly for developing nations, because it makes them more vulnerable to external shocks. Rising or high debt exposes a country to economic and financial crises such as increases in refinancing costs which can lead to financial crises with substantial and long-lasting negative impacts on economic activity. Over the last fifty years, such bouts of fast debt buildup followed by financial crises have been a recurring characteristic in emerging countries.

Developing countries are continuously encounter with the problem of increasing debt, and it is very critical for them to eliminate debt crises. Because domestic savings and export profits, according to (Chenery,

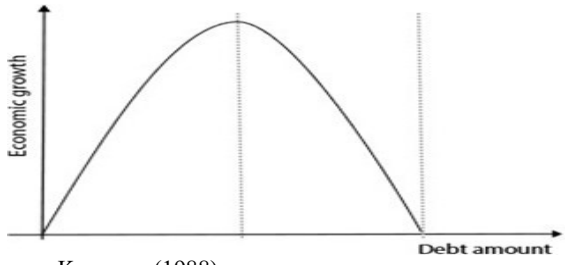
1966), are not sufficient to fulfill the demand for investment in developing countries That's why developing countries depend on foreign sources to bridge the void left by a lack of savings. The receiving nations tend to expand because of increased investment with cash given by external sources. Many South Asian countries are cause suffering with problem of debt expansion. India's ranking has been improved from moderately indebted low-income nation to less indebted low-income country (World Bank, 2001). In contrast, Pakistan has been shifted from moderately indebted low-income nation to severely indebted low- income country. With the passage of time, the decreasing available resources and modifying resource inflow for example, a surging share of corporate debt with short maturities and higher interest rates and a declining share of concessional debt in total, have doubled the debt burden and adversely affected the debt servicing payments of most developing countries, including Pakistan.

DEBT LAFFER CURVE THEROY

Debt Laffer curve has demonstrated the non-linear relationship of debt and Economic Growth which assume that debt leads to economics growth to a specific level after which debt has adverse impact on Economic Growth. Fig 1.1 shows the Debt Laffer Curve, The Curve portray the that on the highest point of curve a country can maintain this level of Debt without worry about its negative effect on Economic Growth. But if Debt cross this point the economic growth will be limited, and debt repaying is beginning to be problematic (Krugman, 1988) and (Villieu, 2014).

FIGURE 1

Debt Laffer Curve



Source Krugman (1988)

The Debt Laffer Curve may be used to demonstrate the link between the nominal value of the debt and the investment (Cohen, 1992), as the curve explains that once outstanding amount exceeds the particular threshold value, the borrowing potential starts to decrease. (Fosu,1999) Use the debt Laffer curve theory to assess the non-linear relationship between external debt and economic growth in Sub-Saharan Africa.

Today continues growing debt level is a worldwide phenomenon especially in developing economies the rapid growing debt accumulation increasing the burden of repayment and obstructing the economic growth. The purpose of this paper is to study the nexus among debt level and important macro variables like inflation, exchange rate, investment, and government expenditure and trade openness. The growing debt level also intended the policymaker to design the policy in such way that can be helpful to reduce the negative consequences of debt on economic growth for this study try to find out the threshold value of debt that to what extent debt level is good for economy growth.

The body of the paper is organized as follow, Section 2 discussed the previous studies and theories relevant to our research topic, the model development, and methodology and data issues discussed in Section 3. The estimation results are discussed in Section 4. Section 5 comprises on conclusion and policy implications.

II. REVIEW OF LITERATURE

The Harrod-Domar Growth Model explains the significance of External Debt in narrowing the savings-investment disparities in developing countries. The model illustrates that Economic Growth is a function of the Saving Ratio and the Capital Output Ratio; high Economic Growth may be attained by increasing the amount of Savings and decreasing the Capital Output Ratio; when capital resources are abundant, the Capital Output Ratio is low. Mostly developing countries have plentiful supply of labors because of the shortage of physical capital which cause the low Economic Growth. Economic Growth is the function of capital accumulation, which in turn depends upon the cost of return (Roberts, 1942). Classical economic theory suggests that high Economic Growth could be accomplished by escalating the investment which, in turn, depends on the attainability of resources. (Solow,1956), contributing to a

higher level of national income. Higher wages create savings for more persons. Alfred Marshall, a well-known economics analyst, emphasized on saving, and the nature of free economies, among other contributing factors, to achieve a higher degree of economic growth.

To increase Savings Ratio is not easy in developing countries most of the countries have low marginal propensity to save. Savings are strongly related to income growth when the individual person of a family plan their spendings according to their income profiles (Deaton, Angus, and Christina Paxson, 2000). Moreover, the increased saving rates do not necessarily leads to Economic Growth with additional dependency rates; like savings for rainy-days (Athanasios, Orazio, Lucio Picci, and Antonello Scorcu , 2000). Extra income often used to fulfill the increased consumption which leads to decrease the savings. Many developing countries are experiencing the low domestic saving.

There is a vast range of literature available done by many economic researchers that is focused on the direct link of debt and other macroeconomic factors, hence it is feasible to categories the literature. The initial sections of research identify the causes and origins of debt accumulation, such as (Chenery, 1966) gave the fundamental reasons for the high accumulation of debt in developing countries, i.e., the reduction of savings and investment, would encourage countries with insufficient savings to borrow money from the domestic or international debt market in order to ease consumption and support economic development. Printing money, depleting foreign exchange reserves, borrowing overseas, and borrowing domestically are the four primary methods of funding a fiscal deficit (FischerS, 1993).

Moreover, poor tax collections, low investment ratios and government deficits are the primary causes for developing countries to seek the debt relief (Gohar, 2012). There are two principal reasons for borrowing by governments: (i) future government revenue expected to be less than future government expenditures (ii) to pay off the matured government debt (Babu, J. O., Kiprop, S., Kalio, A. M., and Gisore, M, 2015).

Economists are of the opinion that debt burden was on its biggest level worldwide in 1970, known as the period of economic crisis. As

(Looney,1987) Investigated, external debt issues in mineral-oil and non-mineral-oil economies. In Author's view, developing countries' debt accumulation has never been constant. The study is designed to illustrate that mineral-oil economies borrow oil in international markets for reasons different from those of other developing economies. The cross-section regression results for 82 countries showed that foreign reserves, military spending, and export concentration all had a substantial negative impact on external debt in mineral-oil economies. He also made discovery that gross domestic product and current account balance enjoyed a beneficial impact on mineral-oil economies' foreign debt. For a variety of reasons, there sults for non-mineral-oil economies were not strong. while other developing countries, military expenditure had a huge positive impact on foreign debt, and current account balance had a negative effect.

Ugurel, 1999 examined several elements of Islamic nations' external debt across 30 years and made several solutions. (SESRTCIC, 2002) Contrasted African and other Organization of Islamic Cooperation (OIC) member nations' external debt metrics to those of other developing countries. In addition, the study provided a brief review of international debt reduction initiatives and their consequences for OIC-Heavily Indebted Poor Countries. Moreover, neither publication employed econometric approaches and just gave a descriptive analysis.

Tiruneh, 2004 examined the external debt drivers for a sample of 60 nations, by using the fixed and random effect models from 1982 to 1998, 21 countries out 60 were seriously burdened impoverished countries and 39 of which were semi indebted developing countries. The estimation findings revealed that the key predictors of foreign debt are income per capita, capital flight, the imports-to-GDP ratio, debt service payments, and GDP growth rate. The writer advocated for debt relief for poor nations as well as a competent debt management approach.

Kasidi, F., & Said, M, 2013 checked the link between external debt and economic development in the country of Tanzania for the period of 1990 to 2010, he chose the cointegration method and the research showed that debt repayment and external debt have a notable influence on GDP growth. Additionally, the co-integration test is evident that no relationship was found between external debt and GDP in long run.

Benedict, I., Ehikioya, I., & Asin, O., 2014 studied the factors that play part to Nigeria's external debt for the period from 1986 to 2010.Error Correction Analysis and Johansen Co-integration were utilized. The findings indicated a long-run connection between foreign debt and the independent factors. The studies also suggested that the important factors are GDP, debt service, and currency rate.

Using the Cobb-Douglas production function, (Al-Refai, 2015) investigated the link between debt and economic development in Jordan from 1990 to 2013. The findings revealed a positive and statistically significant link between Jordan's gross fixed capital creation and domestic debt and economic development. In addition, the findings revealed a negative and negligible connection between labor, foreign debt, and annuities.

Waheed, 2016 looked into Bahrain's state debt sustainability from 1990 to 2014. Their search measured debt sustainability using more stringent time series econometric methodologies. The ARDL bound testing technique result validated the country's public debt's sustainability during the research period. The analysis also evaluated the financial response function and concluded that the country's budget policy actions were enough to preserve debt sustainability.

Waheed, 2017 pointed out the factors that led in the foreign debt into two groups of countries i.e., exporters and importers of oil and gas. The study studied panel data from 12 oil and gas selling countries and 12 oil and gas buying states from 2004 to 2013. The study discovered many macroeconomic variables that have great impact on the set of groups of countries' foreign debt. The study’s prominent caught was that the causes and impacts of macroeconomic factors on foreign debt differed across oil and gas exporting and importing states.

The second parts the studies look at the influence of debt accumulation on economic development. The available previous studies describe debt has both negative and positive effect on Economic Growth. Majority of the theoretical and empirical investigations have shown the negative relation between debt and Economic Growth.

To fund foreign loans, governments must raise taxes, lowering family net incomes, which may result in lower predicted returns and

scarcely stimulating investment for economic development (Modigliani, 1961). Furthermore, foreign debt places pressure on interest rates, decreasing the private investment and weakening the economy (Friedman, 1988). To explain the consequences of external debt on economic growth, debt overhang theory was explicitly used. Debt overhangs occur when the expected External Debt payback exceeds the agreed- upon value of the debt (Krugman, 1988). While (Borensztein, 1990) said when the debtor countries have gained very little benefits against any additional investment due the payment of debt service this condition is known as debt overhang.

Debt overhang theory also depict that if there is the situation of high inflation, currency devaluation and any other economic instability due to the payment debt service then the investors invest less in the economy. Debt renegotiating discourages investment as it causes instability in the market climate (Claessens & Detragiache, 1996). The debt-service costs of public debt will surpass public investment spending, thus lowering overall investment both directly and indirectly by lowering additional private spending (Diaz-Alejandro, 1981).

Heavy debt constraint means that government's short-term earnings will be exhausted to fund the debt, exhausting out public investment in the economy (Serieux, J. and Yiagadeesen S, 2001). Due to same crowding out effect (Iyoha,1996) showed a strong connection between external debt and economic development in Sub-Saharan African countries (Mwaba,2001) select usual least squares to apply the fundamental growth equation to the negative impact of foreign debt upon Ugandan economic development. The results show that accumulated debt have a negative and statistically significant negative influence on growth, but new debt inflows have a favorable effect on growth. (Calderón, C., and Fuentes, J. R,2013) found the detrimental effect of external debt on Latin American economic growth from1970 to 2013. Using time series data from 1945 to 2003, (Tchereni, 2013) discovered a negative but negligible relationship between external debt and economic growth in Malawi. (Senadza, Fiagbe, & Quartey, 2017) Used the Generalized Methods of Moment approach to assess the negative effect of External Debt on Economic Growth in 39 Sub-Saharan African nations for the period 1990-2013.

External debt has negative consequences in developing countries due to poor governance, and these adverse outcomes are likely to outweigh any future advantages from debt usage in more efficient initiatives that bring value to the economy. According to (Jain, 1993), the reason of debt accumulation in developing nations is a lack of bureaucratic restraints and unrestrained government corruption in authoritarian governments. A small body of economic literature shows that external debt has a considerable beneficial influence on economic growth. External debt has a favorable impact on domestic savings and investment in terms of capital inflows, which leads to economic growth (Eaton, 1993).

Using the vector error correction approach, (Michael, 2012) discovered the favorable influence of external debt on economic development in Nigeria from 1970 to 2010. Using co- integration and vector error correction methods, (Kasidi, F., & Said, M, 2013) revealed a positive association between external debt and economic growth in Tanzania from 1999 to 2010. They contend that external debt is favorably associated to economic growth, whereas debt service has a negative impact on economic growth.

The third part of the literature describes the non-liner relation of Debt and economic growth. (Eisner, 1984), (Calvo, 1998) explains that External Debt at reasonable level increase the Economic Growth. (Krugman, 1988) use debt Laffer curve to explain the debt overhang theory while (Cohen, 1992) highlights that debt Laffer curve can be used to exaplain the link between the nominal value of the debt and the investment, the curve demonstrates that once outstanding debt exceeds a certain level, borrowing potential begins to decline.

Elbadawi, 1996 used a fixed-effects panel model to discover a non-linear link between external debt and economic development in 99 developing nations. (Catherine Pattillo, 2002). Discovered the threshold effect of external debt in 93 developing countries from 1969 to 1998 using a basic OLS and instrument variables approach, with control variables including per capita income, investment rate, secondary school enrolment, and population growth. (Nguyen, 2003) to calculate the threshold value in 55 less developed countries used the GMM estimation approach from 1970 to 1999.

Maghyereh, 2002 used the OLS estimator to estimate the threshold value of external debt for economic development in Jordan from 1970 to 2000, utilizing inflation, gross capital formation, and government spending as major variables. (Frimphong, 2006) Used the Vector Correction Model to calculate the threshold value of Ghana's external debt from 1970 to 1999.

Reinhart, 2010 estimated the threshold value of External Debt by using a panel regression study of a survey of 44 advanced and emerging countries altogether by covering 200 years spans. (Hoang, 2018) has calculated the threshold effect of External Debt in South Asian countries from 2006-2014 by applying regression method with fixed effect model he took macro variables total investment to GDP, balance budget to GDP and trade index for his study.

III. METHODOLOGY

MODEL SPECIFICATION AND DATA

In this research we investigate the impact of government debt level on economic growth that to what extent government debt is beneficial for economic growth in South Asia for this first of all we investigate some major economic factors as the determinants of government debt by using fixed effect linear regression model then we find out the threshold level of debt following the (Hansen, 1999) Fixed effect Threshold Regression Model.

So, we are using inflation, exchange rate, total investment (Gross Capital Formation), government expenditure and trade openness as the determinants of government debt accumulation. The data of inflation, total investment (Gross Capital Formation), government expenditure and trade openness has been collected from World Bank Data set while the data of government debt level has been gathered from Kose, M. Ayhan, Sergio Kurlat, Franziska Ohnsorge, and Naotaka Sugawara (2017). “A Cross-Country Database of Fiscal Space.” World Bank Policy Research Working Paper 8157, World Bank, Washington, DC. While the data of exchange rate collected from Asian Development Bank. The total amount of Government external financial commitments is referred to as its debt, incur debt to pay for spending that exceeds income. Inflation, as determined by the implicit deflator of the annual GDP growth rate,

displays the overall rate of change in price in the economy. GDP in the new local currency to GDP in the constant local currency is the inferred deflator. As the weighted average of numerous foreign currencies is used to calculate the currency's value, a price deflator or cost index is used to determine the genuine effective exchange rate.

Expenses are financial charges for the Government's expenses in the procurement of goods and services. This covers rewards for workers, such as wages and pensions, taxes and subsidies, scholarships, welfare services and other costs, such as rent and dividends. Expenditure is expressed as a % of GDP.

Total investment is expressed as a proportion of GDP. Total investment is the percentage of current local currency GDP is calculated. To calculate the investment or gross capital formation, one considers all the changes in inventories and acquisition, as well as the disposable assets, for each unit or sector. Trade in commodities as a percentage of GDP is a commonly used metric.

Model 1

Fixed-Effect Regression Model

The functional relationship among these variables is specified as:

$$GD = f(Inf, Exchg, Tinvs, Govtexpn, Trade) \ldots\ldots\ldots (1)$$

$$\boldsymbol{GD = \beta_0 + \beta_1 Inf + \beta_2 Exchg + \beta_3 Tinvs + \beta_4 Govtexpn + \beta_5 Trade} \quad (2)$$

Where

GD = *Government debt*

Inf = *Inflation*

Exchg = *Exchange Rate*

Tinvs = *Total Investment*

Govtexpn = *Government Expenditure*

Trade = *Trade*

and $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ are their corresponding coefficients.

MODEL 2:

Fixed-Effect Panel Threshold Model

To estimate the threshold, we will use (Hansen, 1999) Threshold Panel Regression Model. Later (Wang, 2015) developed a methodology to estimate threshold model to overcome the existence of nuisance parameters. This method is the best way to test the hypothesis that the equation can be apart into two regimes depending on the value of threshold variable. If there exist at least one variable, we can say that the dependent and independent variable have non- linear relationship. According to (Wang, 2015) single threshold model would be:

$$Y_{it} = \mu + Z_{it}(q_{it} < \gamma)\alpha_1 + Z_{it}(q_{it} \geq \gamma)\alpha_2 + \vartheta_{it} + \varepsilon_{it} \quad (3)$$

Where q_{it} threshold variable, γ is the threshold estimated value that separates the equation

(3) into two regimes with α_1 and α_2 are coefficients. The ϑ_{it} is the individual fixed effects and

ε_{it} is the error term.

We can also write equation (3) as:

$$Y_{it} = \mu + Z_{it}(q_{it}, \gamma)\alpha + \vartheta_{it} + \varepsilon_{it} \quad (4)$$

Where

$$Z_{it}(q_{it}, \alpha) = \begin{cases} Z_{it}(q_{it} < \gamma) \\ Z_{it}(q_{it} \geq \gamma) \end{cases}$$

For given γ, the ordinary least square estimator for α is:

$$\hat{\alpha} = \{Z^*(\gamma)' \, Z^*(\gamma)\}^{-1}\{Z^*(\gamma)' Y^*\}$$

Where Z^* and Y^* are with-in group deviations. The residual sum of square is equal $\widehat{\varepsilon^*}' \, \widehat{\varepsilon^*}$

The estimator for threshold parameter γ is chosen which minimize the sum of squared error(RSS) (Wang, 2015).

$$\hat{\gamma} = arg_{\gamma} min S_1(\gamma)$$
$$\gamma \epsilon (\gamma, \overline{\gamma})$$

Because the nuisance parameter problems cause the distribution of the threshold definition to be non-standard, it is necessary to test the hypothesis $\gamma = \gamma_0$ (in which γ_0 is the true value of γ). (Hansen, 1999) Argued that the optimum method to generate a confidence interval would be to utilize a non-reject area system with likelihood ratio statistics. The likelihood ratio is constructed as follows:

$$\boldsymbol{LR_t(\gamma_0) = \frac{S\gamma_0 - S(\hat{\gamma})}{\widehat{\sigma^2}}}$$

The F-Statistic of the chance ratio test under Ho of no threshold effect is created as follows totest for the presence of a threshold effect:

$$\boldsymbol{F_t = \frac{S_0 - S_1}{\widehat{\sigma^2}}}$$

Because the Ft distribution is non-standard. So (Hansen, 1999) Suggested a bootstrap method to represent the asymptotic distribution of the likelihood ratio test. The null hypothesis is rejected under Ho in case of p-value for F- Statistic is less than the critical value. Following this our model would be:

$$\boldsymbol{EG_{it} = \beta_0 + \beta_1 GD_{it} I(GD_{it} < \gamma) + \beta_2 GD_{it} I(GD_{it} \geq \gamma) + X_{it} + \mu_{it} + \varepsilon_{it}} \quad (5)$$

Where the indicator functions I (.) is created:

$$\boldsymbol{I(GD_{it}, \gamma) = \begin{cases} 0 \; if \; GD < 0 \\ 1 \; if \; GD \geq 0 \end{cases}}$$

The Government debt level (GD) is a threshold variable and γ is estimated threshold value. When the GD is less than γ, then the indicator is 0 if exceeded the γ, then the indicator function is 1.

The variable that is reliant EG denotes the yearly GDP growth rate at market prices, which is dependent on a stable local currency. GDP is the gross benefit created by all citizen firms in the economy, plus all goods taxes and minus all incentives not included in the value of products. Regardless of the depreciation of produced goods or the degradation and depletion of natural resources, this figure is calculated. The World Bank dataset is used for data collection. X_{it} represent the control variables (inflation, Exchange rate, total investment, government expenditures and trade) which is used to track the impact of control variables on economic

development at the threshold. μ_{it} Country and time fixed effects and s_{it} is the error term and $\beta_0, \beta_1, \beta_2$ are coefficients respectively.

IV. RESULTS

The estimation starts with the selection of appropriate estimation method. In terms of choosing an effective estimation method, it is important to evaluate unobserved or individual specific effects. Therefore, we performed the F-test, Wald-Test, Breusch and Pagan Lagrangian Multiplier test and Hausman test to select the most appropriate method. Table 1 shows the results of different test. However, all test results shows that fixed effect is appropriate.

TABLE 1

Results of Different Test

TEST	F-Test	Wald Test	Breusch & Pagan Lagrangian Multiplier Test	Hausman Test
Purpose of Test	Test for F.E, R.Eand Pool OLS	Test the heteroskedasticity for F. E	Select between R.E and OLS	Select between R.E and F. E
Test Statistics	POLS: Prob>F=0.0000F.E: Prob>F=0.0010R.E: Prob>Chi2=0.000	Prob > chibar2 = 0.0000	Prob > chibar2 = 0.0000	Prob > chibar2 = 0.0000
Conclusion	All three methods are suitable	Hetero exist so F.E is appropriate	OLS is appropriate	F.E effect is appropriate

Source: Author's computation

The variance inflation factor (VIF) is used to test the multicollinearity among variables. For the authenticity of the model. Table 2 shows the results of multicollinearity. The VIF shows the multicollinearity between the independent variables, if the VIF is less than 10 and the mean value is less than 3, this ensures that there is no multicollinearity. Otherwise, there's multicollinearity (Belsley, 1980).

TABLE 2

Result of Multicollinearity test

Variables	VIF	1/VIF
Trade	4.51	0.221523
Govtexpn	3.21	0.311530
Tinvs	2.40	0.417360
GD	1.71	0.0583106
Exchng	1.38	0.724852
Inf	1.04	0.963884
Mean VIF	2.38	

Source: Author's computation

The Levin- Lin- Chu test is also used to do a stationary test on all variables. The results of thestationary test are summarized in Table 3.

TABLE 3

Results of Unit-root test

Variables	Statistics	p-value
Trade	-1.7563	0.0395**
Govtexpn	-1.3924	0.0819*
Tinvs	-2.5092	0.0060***
GD	-2.8775	0.0020***
Exchng	-1.0075	0.1569*
Inf	-3.0500	0.0011***

Source: Author's computation

The asterisks represent the p-value significance level (p<0.1*,p<0.05**,p<0.01***)

All variables indicate a p-value similar to zero, suggesting that a null hypothesis is dismissed for panel data containing unit roots. These observations show that there is no non-stationary problem with any of the variables.

Fixed-Effect Regression Model

By using Fixed-effect regression model the results of equation 2 is presented in Table 4.

TABLE 4

Determinants of Government Debt

GD	Co-efficient	S.E
Inf	0.0257281	0.2351403
Exchng	0.0215671	0.1035907
Tinvs	0.0332457	0.1587345
Govtexpn	-1.119457	0.5877709
Trade	-0.180007	0.122279
Constant	76.14666	14.08427

Source: Author's computation

Table 4 shows that increase in inflation will lead to increase the government debt level, because high inflation is associated with issuance of foreign currency debt (Calro, 1988). It is necessary to borrow from foreign resources to maintain a stable exchange rate as inflation rises, and this led to an increase in the country overall external debt. (Barro, 1979) Argues, both logically and practically, that inflation positively affect the debt. (Lau, 2015) In the instance of Malaysia, experimentally, a unidirectional correlation flowing from inflation to foreign debt was discovered.

Exchange rates have a significant impact in the accumulation of debt level of any country. The higher exchange rate indicates the weak local currency against foreign currency which show that a decrease in the value of currency lead to increase the external debt. For example, in the 1980s, in order to avoid inflation, Argentina introduced a fixed exchange rate to combat inflation. The plan was that if the government decided to print more currency, it would haveto keep the same sum of dollars. In the old system, the government could print more currency, and that caused inflation. They could only print more money under the current scheme if they had more dollars. Yet the government was eager to print currency, so they began to borrow dollars. Eventually, this foreign debt became unmanageable, and Argentina began to default. The estimated positive co-efficient of exchange rate in Table 4 indicates that positive relation between exchange rate and debt accumulation in South Asia. The results fit with the research (Gokmenoglu K., 2018) they argue that external debt precedes the exchangerate depreciation.

The positive sign of Total investment in terms of gross capital formation indicates the positive relation between government debt and investment. Economist believes that nations with high capital accumulation can achieve faster Economic Growth than the nations with low capital accumulation, because capital is most effective driver for productivity (Hey, 1972). Most of the developing nations don't have enough financial resources to achieve their high Economic Growth goals. This is partially due the low-level domestic savings and investment, limited productivity, and high consumption trends, therefore the government look towards external financial resources to support domestic savings and to invest in infrastructural projects and organizational superstructures was deemed necessary to achieve accelerated Economic Growth (Aluko F, 2010). According to (Michale P. Todaro, 2006) at early stages of progress developing countries mostly depend upon External Debt because of insufficient domestic capital for investment. Therefore, a source of capital from loans, particularly from foreign loans, is believed to be one of the most significant sources of financing for the developing nations.

Government expenditure is a fundamental component of fiscal policy that may be utilized to promote either expansionary or contractionary economic aims. The negative sign of co- efficient in Table 4 shows that government expense has inverse relation with debt this is only possible if government cut down its expense this will reduce the annual government borrowing and can help to reduce the total public sector debt some of the researcher argued that there is always a time in an economy where there is a need to cut down the government spending otherwise the debt rises to the dangerous level. (Martin, 1991) said that in the start of the 1980 many emerging states had tried to limit their net external financing due to a mounting debt and interest rate. Debt interest payments increased frequently, indicating that global interest rates were increasing, pressurizing the deficit. But, as the decade went on the overall effect of debt and interest was offset i.e., lower deficit decreases the debt accumulation slowly, real interest rate dropped from high level, and the increase the debt interest payment slows down notably. He suggested that by decreasing the spendings and increased the tax revenue can be helpful in reducing deficit.

International Trade is a powerful instrument in developing countries to stimulate economic growth. Trade openness has a huge impact on the economic, social, and political lives of nations since proper trade policies create economic benefits while unsuitable policies cause severe disruption at the national level (Wik, 2007). The negative sign of trade co-efficient in Table 4 indicates that the increased in trade can be helpful to reduce debt level i.e. trade openness tends to boost the economic growth, productivity and exports which in turns have positive impact on debt servicing.

Threshold Regression Model

We run equation 5: to test the presence of threshold. Table 5 shows the calculation of Threshold Summary.

TABLE 5

Threshold Summary

Threshold	Single
Threshold Value	16.24
Boots trap p-value	0.0000
95% C. I	9.13, 19.05
F- Statistics	17.04
Crit10, Crit 5, Crit1	8.73,10.51,13.72

Source: Author's computation

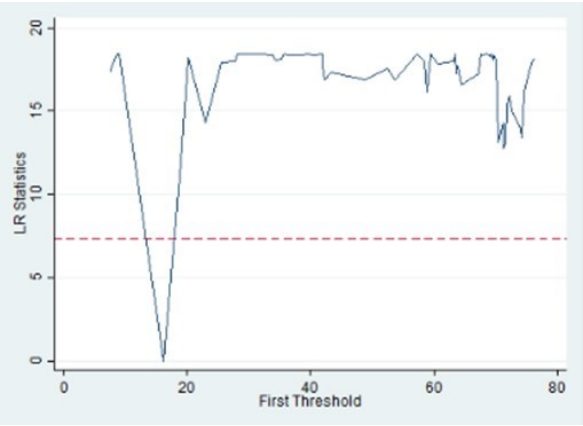
Table 5 shows that the threshold obtained for external debt is 16.24. The bootstrap p-value confirms that the $\mathbf{H_0}$ "no threshold" is rejected at 10%, 5% and 1% critical value. The F statistics 17.04 is greater than critical value 18.73, 10.51 and 13.72 at 10%, 5% and 1% respectively. Therefore, we can say that there exist threshold effect and external debt economic growth are non-linearly related to each other.

Construction of Threshold Value

After checking the existence of the threshold (Hansen, 2000) also offer the construction of confidence interval dependent on likelihood ratio. Fig 2: would help to explain the construction of the external debt threshold, the red line represents the 95 % critical value of 7.35 (Hansen, 2000) and the blue line represent the likelihood ratio of the

threshold. The likelihood ratio (LR) for each γ as well as the critical value for the 95 % as seen in the horizontal axis. Below this line is the no-rejection field, where the values that fall within this area are the set of all possible γ_s for which the true threshold value is γ^*. Thus, the calculated threshold value is the point where LR (γ)=0, which is 16.24. The debt threshold is at 16.24 where blue line crosses the red line.

FIGURE 2



The form of LR axis, according to (Hansen, 1999), represents the intensity of the threshold influence, A "V" shaped line implies that the threshold effect is high, which validates the splitting of sample and separate estimates for each subsample (Vašíček, 2012).

The findings of Threshold Model show non-linear relationship between government debt and economic growth which back the findings of (Wanniarachchi, 2020) who found the 80.19threshold value of external debt in South Asian Economies. He believes that in Sri Lanka, the debt-to-GNP ratio was higher than these crucial levels greater than 50% in the 1990s, but due to a powerful external sector, the debt-to-export ratio was, on average, less than 170%. In Pakistan in the 1990s, both ratios were over the threshold level and on the rise. The debt-to-output ratio in India is below the crucial level, while the debt-to-export ratio is over the critical level, but with a declining trend since the 1990s. As a result, South Asia's debt position has changed and is getting complicated for states.

V. CONCLUSION AND POLICY IMPLICATION

External debt is an important source of money for socioeconomic progress, especially in emerging countries. Borrowing foreign debt at any cost, however, is not suggested, nor can external debt be viewed as a last resort to boost short-term growth without respect for long- term sustainability during the country's socioeconomic development.

First, this study has attempted to calculate the impact of selected macroeconomics variable on government debt level and the results depict that Inflation, Exchange rate and Gross Capital formation are the source of increasing debt level in South Asian economies. In contrast Government Expenditure and Tarde could lead to a reduction in debt if resources utilized wisely by adopting the new and advanced technologies, enhanced the skilled labor capacity to make the industries more efficient and productive. On the other hand, increased export level led to decrease the debt burden, because the high level of export are associates with the high level of production in industries which reflects that more people are working in the industries to keep them operating, and there is trade surplus in the economy.

By taking the prior mention results under consideration the policy maker should take in account the management of reserves. Government must establish the free trade zones, grant tax break to the foreign investors and create a business-friendly economic climate which might encourage the foreign direct investment in the countries. Policy makers also introduce the legal banking channel through which all overseas workers could be able to transfer their work remittances to the countries. In tandem, the countries should increase their export income in order to maintain a high reserve level.

As a result, at both the policy and operational levels, both service and commodity exports should be supported. Governments should incentivize export-oriented development regimes rather than giving undefined foreign assistance to local enterprises. A balance must also be struck between labor-intensive industries like agriculture and advanced industries like capital-intensive and manufacturing sectors. In addition, assistance for these firms should focus on the educational and skills set of the local people in order to ensure that they are fully equipped and well informed in their respective fields. Otherwise, the government have

chances to waste the opportunity to be benefited by draining the resources away from the profit potentials arears. These include telecommunication and financial services, warehousing, and other commercial services exports. Countries need to clearly identify their export niche market.

Second, the study also found the optimum level of debt that could be fruitful for economic growth and the findings shows that there is non-linear relation between debt and economic growth with the threshold value 16.4 indicates the debt burden beyond this level detrimental to economic growth.

As a consequence of a fore mentioned findings the policy maker should establish the polices that could help to minimize the negative impact of debt burden. To get the best economic results, the risk management structured needs to be developed, the threshold level need to be set, so that economic growth can be achieved. The government should either by raising the domestic resources or by restricting the government spendings. However, countries in the area must establish the debt threshold in accordance with their spendings demands at the economic, debt service, and economic growth rates of each period if they want to make better use of debt. They will need to create an acceptable lending policy to use the loan wisely to maintain their solvency in various circumstances and to minimize the burden while at the same time evaluating the possible risks of debt and ensure that debt size is compatible with the pace of economic development and does not raise the country's debt burden.

If the government borrows to pay for the budget deficit by interest, in particular foreign debt, this will add to debt pressures in the future and adversely impact the economic development in the long run. On the other hand, the potential of the countries of the region to fund foreign debt in the short term is the key explanation for a downturn in private spending, which, in essence, decreases the available resource for national productivity and hinders economic growth. One of the main solutions is therefore to increase both the quantity and the quality of the export operations. Goods and utility costs of the countries in the region have a beneficial influence on profitability.

It is necessary to improve cooperation between fiscal policy and monetary policy. Balance of government budget is a perfect balance, both as a justification and as a product of other macroeconomic balances. It is therefore important to improve the productivity of the fiscal policy, to reduce the government deficit step by step along a given direction with appropriate measures, to maintain a balance between the overall investment capital and the social capital while at the same time maintaining a good fiscal condition. In order to restore the fiscal discipline, it is also important to minimize the budget deficit, not by increasing earnings, but by reducing expenditure on the basis of increasing the efficiency of spending. Earnings that meet the targets will not be used to increase expenditure but to pay for the fiscal deficit.

In order to ensure effectiveness in the alignment of the two strategies, their execution must be connected to strong goals. It needs to improve knowledge trading between the policy management authorities right from the policy-making level. Establishing effective cooperation between ministries in the management of macro-economic policy, in the maintenance and monitoring of broad economic balances; effective response to negative economic impacts is also needed. It is also important to renew the macro-economic management approach by setting up an early warning mechanism to detect the possibility of financial insecurity.

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APPENDIX

The result of B&P Lagrangian Multiplier Test

Breusch and Pagan Lagrangian multiplier test for random effects

GGDL[COUNTRIES,t] = Xb + u[COUNTRIES] + e[COUNTRIES,t]

Estimated results:

	Var	sd = sqrt(Var)
GGDL	610.847	24.71532
e	63.2508	7.953037
u	446.5438	21.13158

Test: Var(u) = 0

chibar2(01) = 133.21

Prob > chibar2 = 0.0000

The result of Wald Test

Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i

chi2 (7) = 602.67

Prob>chi2 = 0.0000

The result of Hausman Test

	Coefficients (b) fe	(B) re	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
GGDL	-.062833	.0801186	-.1429516	.0339832
INFL	.1206492	.0528006	.0678486	.013265
EXCHNG	-.0021039	-.0140017	.0118978	.0286255
GOVTEXPN	-.1685719	-.1789845	.0104126	.1196397
TRADE	-.0028608	.0008219	-.0036826	.0247833
Totalinvest	-.091688	.0375395	-.1292275	.0257062

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B)

= 30.09

Prob>chi2 = 0.0000

(V_b-V_B is not positive definite)

The results of Multicollinearity

Variable	VIF	1/VIF
TRADE	4.51	0.221523
GOVTEXPN	3.21	0.311530
Totalinvest	2.40	0.417360
GGDL	1.71	0.583106
EXCHNG	1.38	0.724852
INFL	1.04	0.963884
Mean VIF	2.38	

The results of Threshold Estimator

Threshold estimator (level = 95):

model	Threshold	Lower	Upper
Th-1	16.2470	9.1330	19.0570
Th-21	16.2470	9.1330	19.0570
Th-22	7.5130	.	.
Th-3	71.5700	71.1080	71.7760

Threshold effect test (bootstrap = 500 500 500):

Threshold	RSS	MSE	Fstat	Prob	Crit10	Crit5	Crit1
Single	313.5037	4.7501	17.04	0.0000	8.7368	10.5178	13.7282
Double	290.2449	4.3976	5.29	0.4200	11.9725	19.9447	29.1965
Triple	268.8861	4.0740	5.24	0.5480	14.0794	18.2721	25.0504

The result of Fixed Effect Regression

Fixed-effects (within) regression — Number of obs = 77
Group variable: COUNTRIES — Number of groups = 7

R-sq:
within = 0.1688
between = 0.1690
overall = 0.0994

Obs per group:
min = 11
avg = 11.0
max = 11

F(6,64) = 2.17
corr(u_i, Xb) = -0.6002 — Prob > F = 0.0577

GGDL	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
GDPG	-.6290027	.3876022	-1.62	0.110	-1.403327	.1453217
INFL	.0257281	.2351403	0.11	0.913	-.4440186	.4954748
EXCHNG	.0215671	.1035907	0.21	0.836	-.1853791	.2285133
GOVTEXPN	-1.119457	.5877709	-1.90	0.061	-2.293665	.0547499
TRADE	-.180007	.122279	-1.47	0.146	-.4242875	.0642734
Totalinvest	.0332457	.1587345	0.21	0.835	-.283863	.3503544
_cons	76.14666	14.08427	5.41	0.000	48.01009	104.2832
sigma_u	29.94424					
sigma_e	7.8549497					
rho	.93561879	(fraction of variance due to u_i)				