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Safia Shabbir

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# Does External Debt Affect Economic Growth: Evidence from Developing Countries

Safia Shabbir, Deputy Director, State Bank of Pakistan, safia.shabbir@sbp.org.pk

***Abstract***

*This paper explores long run relationship between external debt and economic growth in developing economies. By using a sample of 70 developing countries over a period of 1976-2011, the study finds that increase in external debt stock reduces the fiscal space to service external debt liabilities and thus dampens the economic growth. Moreover, it reduces the level of private fixed capital formation in the country. Exploring the role of investment towards economic growth, we find that both the foreign direct investment and the fixed capital formation help these economies to grow, while openness contributes to the welfare of the developing economies.*

**JEL Classification:** F34; F43; O47

**Keywords:** External debt; Growth; Economic Growth

## Non-Technical Summary

Fixed capital formation is the key to economic growth. Although developing economies strive for higher economic growth trajectory, but given higher fiscal imbalances, they find it harder to generate investment opportunities that can help them to progress. Therefore, reliance of these economies increases on foreign borrowings, which leads to substantial external debt stock over time. External debt does not necessarily imply slow economic growth. It is a country's inability to meet its external debt obligations that pose a risk to economic prosperity and often leads to debt overhang.

Developing economies typically have limited sources to generate revenues. If they fail to channel external funds to enhance productivity and create new employment opportunities then they are eventually stuck with lower tax revenues and higher debt servicing, leading to higher deficits. Moreover, inability to service debt on time not only makes it harder for the developing countries to get aid at concessional rates with less conditionality from donor agencies but it also increases the sovereign risk. This, in turn, reduces the flow of foreign direct investment into the country and increases its reliance on domestic resources which disrupts the balance between fiscal and monetary policies and leads to crowding out, further slowing down the economic growth. Findings of this study also support these theoretical observations and we observe long run inverse relationship between external debt indicators and economic growth, while fixed capital formation helps the economy to grow. We also observe that external debt servicing significantly reduces private fixed capital formation.

# I. Introduction

Sustainable economic growth is a predominant concern for all economies, especially for the developing economies which commonly face burgeoning fiscal deficits mainly driven by inelastic current expenditure. At initial levels, inflows from external debt provide some ease at fiscal front, and help the economies to grow. However, higher fiscal imbalances, inadequate use of these resources and rescheduling of external debt leads to a higher level of external debt stock and growing debt servicing later on. Moreover, in the wake of meager exports, inelastic imports, and lesser capital inflows, servicing of external debt becomes an issue for less developing economies. In order to service their ongoing external debt repayments, many developing economies raise more external debt, which not only widen their fiscal deficits but also leads to debt overhang. Many countries cut their developmental expenditure to maintain fiscal discipline, which in turn hampers economic growth. While exploring the channels through which external debt might affect economic growth, literature has broadly focused on two theories, i.e., debt overhang theory and liquidity constraint hypothesis. Of which former states that current stock of external debt will slow down the economic growth, while the later focuses on crowding out of the private sector. Adding to the existing literature, this paper investigates the effect of external debt on economic growth of the developing world. In addition, this study explores the role of external debt towards fixed capital formation by the private investors.

Although developing economies strive for higher economic growth trajectory, but escalating current deficit, and low capital formation leaves lesser space for economic growth. Therefore, reliance of these economies increases over the foreign borrowings. Given the poor economic indicators and a limited fiscal space for servicing the external debt, most of the donor agencies provide funds at certain conditions. These conditions commonly include fiscal prudence, economic and political stability, sound banking system, lower cost of doing business, and an environment conducive for investment to ensure further assistance. To address these internal and external concerns, countries often take counterproductive measures by slashing essential capital expenditures that have a large damaging impact on long-run economic growth. Therefore, it is imperative for such economies to provide investment opportunities for the private sector while reducing the cost of doing business that can help them to progress and achieve a higher level of income with improved living standards.

Heavy external debt does not necessarily imply a slow economic growth. It is a country's inability to meet its debt obligations compounded by the lack of information on the nature, structure and magnitude of the external debt (Were 2001). Countries

may have heavy external debt along with relatively higher level of exports that can help them to sustain their level of external debt. But external debt, if not sustainable, imposes higher risk to the economic prosperity, as its servicing which is also an indicator of higher current account deficit, may lead to debt overhang in a country. For any economy, debt either public or publically guaranteed which also includes the contingent liabilities plays a crucial role towards overall economic progress. Developing economies typically have limited sources to fetch revenues. If they fail to channel external funds to enhance productivity and create new employment opportunities; they eventually stuck up with lower tax revenues in contrast with higher debt servicing, thereby leading to higher current deficit. Moreover, inability to service debt on time not only makes it harder for the developing countries to get aid at concessional rates with less conditionality from the donor agencies but it also increases the sovereign risk. That in turn reduces the flow of foreign direct investment in the country and increases its reliance on domestic resources which disrupts the balance between fiscal and monetary policies and leads to crowding out that further slow down the economic growth.

Traditionally, while assessing the external debt vulnerabilities and risk factors that can hamper economic growth, economists' emphasized on two types of indicators, namely external debt indicators and macroeconomic indicators (Loser 2004). However, empirical evidence of exploring the effect of external debt servicing on private capital formation is missing in existing literature. In this backdrop, this paper observes the external debt vulnerabilities on economic growth using a large sample of 70 developing economies over a period of 1976-2011 (36 years). In addition, this paper attempts to evaluate the affect of private investment on economic growth, and also endeavors to determine the factors that affect the overall level of private investment in developing economies. The results of the paper are consistent with both the theories of debt overhang and the liquidity constraint hypothesis, and therefore, conclude that external debt does hamper economic growth, and affect through the channel of private investment.

After reviewing the existing research on the topic in Section II, the paper presents a brief description of data in Section III. The empirical analysis of effect of external debt on economic growth and private investment is comprehensively dealt in Section IV and V, while the subsequent section concludes the paper with policy recommendations on the topic.

## II. Literature Review[1]

Many empirical studies have investigated the effect of external debt on economic growth, some end up finding a negative impact on economic growth while others do not find any significant relationship between economic growth and external debt. Most of these studies have used real GDP and GDP growth rate as dependent variable and tried to explore the direct impact of external debt servicing on GDP growth rate. However, a few studies focused on assessing the impact of external debt on per capita GNI, long term consumption pattern and capital formation. Although findings of these studies are mixed; several studies found inverse relationship between external debt and economic growth. The initial studies on this topic confined themselves to a relatively smaller data set and focused on time series analysis, but later many studies used panel data and sophisticated econometric techniques to deal with various data management and empirical issues. Additionally, with a passage of time, external debt stock of the countries piled up, and became unsustainable over time. Therefore, earlier studies have little evidence for the existence of inverse relationship between external debt and economic growth, while the recent studies find it as a significant issue for the developing economies.

Among the pioneering studies, Geiger (1990) used the lag distributional model to assess the impact of external debt on economic growth for 9 South American countries over a period of 12 years (1974-1986), and found a statistically significant inverse relationship between the debt burden and economic growth. While analyzing 13 developing countries for a period of 1960-1981 and 1982-1989, Warner (1992) could not find any conclusive evidence whether debt has any negative effect on economic growth or it may have depressed investment in those developing countries. Cohen (1993) used a larger data set of 81 developing countries over a period of 1965-87 and did not find any evidence of a negative relationship between external debt and economic growth.

Chowdhury (1994) attempted to resolve the controversy of cause and effect relationship between external debt and economic growth, by conducting granger causality tests for Asian and Pacific Countries over a period of 1970-88. He found that both the public and private external debt has a relatively very small impact on GNP, and both have opposite sings. He found that any increase in GNP leads to a higher level of external debt, but over all external debt does not have any negative impact on economic growth. Gerald (1994) employed simple neo-classical model to

[1] Findings from earlier empirical studies are summarized in Table 1 in Annexure

evaluate whether capital imports can increase output; and whether there are enough exports to meet the external debt servicing in 31 Sub-Sahran African countries. His model suggested that actual surplus available for debt service may be much smaller and may lead to debt overhang. Furthermore, lyoha (1999) used simulation approach to investigate the impact of external debt on economic growth in sub-Saharan African countries estimating a small macro-econometric model for the period 1970-1994. He found an inverse relationship between debt overhang, crowding out and investment thereby concluding that external debt depresses investment through both a "disincentive" effect and a "crowding out" effect, thus affecting economic growth.

Focusing on one of the Heavily Indebted Poor Countries (HIPC), Were (2001) analyzed the debt overhang problem in Kenya and tried to find evidence for its impact on economic growth. Using time series data from 1970-1995, this study did not find any adverse impact of debt servicing on economic growth; however, it confirmed some crowding-out effects on private investment. Furthermore, employing data from 59 developing and 24 industrial countries over a period of 1970-2002, Schclarek (2004) could not find any evidence that external debt may affect total factor productivity. However, he found that in case of developing countries higher growth rate is associated with a relatively lower external debt levels and this negative relationship is mainly driven by public external debt rather than private external debt. While, in case of industrial countries, he could not find any evidence for the existence of such relationship between public external debt and economic growth.

Similarly to investigate the impact of external indebtedness on economic growth for Sudan, Mohamed (2005) used a time series data from 1978–2002 including the growth rate of real export earnings to capture the impact of export promotion strategy and inflation to capture macroeconomic policy impact. He used real GDP annual growth rate as dependent variable and concluded that external debt and inflation deter economic growth, while, real exports have positive and significant impact on economic growth. Villanueva et al. (2006) used standard neo-classical growth model to explore the dynamics of capital accumulation, external debt and economic growth for Philippines over a period of 2000-2003. They used goal seek technique to estimate the steady state ratio of external debt to GDP associated with doubling the per capita income. Additionally, he also tried to estimate the optimal savings rate that is "consistent with maximum real consumption per unit of effective labor in the long run". He concluded that higher ratio of change in interest rate spread to change in debt-to-GDP lower welfare in long run.

Adepoju et al. (2007) analyzed the time series data for Nigeria over a period of 1962 to 2006. Exploring time to time behavior of donor agencies as an outcome of various bilateral and multilateral arrangements, they concluded that accumulation of external debt hampered economic growth in Nigeria. Furthermore Jayaraman et al. (2008) focused on the flow of foreign aid in 6 Pacific Island countries over the period of 1988-2004. These countries had been among the top recipients of foreign aid till early 80s, but later on could not maintain the level of higher aid inflows due to change in political situation thereby subsequently fell into the trap of twin deficits. While assessing whether the higher flow of foreign aid and external debt had ever contributed to economic growth in these countries, the study concluded a significantly positive relationship between external debt and real GDP; and an inverse relationship between higher fiscal deficit and GDP growth.

Hameed et al. (2008) explored the dynamic effect of external debt servicing, capital stock and labor force on the economic growth for Pakistan for a period of 1970-2003. They found an adverse effect of external debt servicing on labor and capital productivity which ultimately hampers economic growth. Butts (2009) investigated the causal relationship between short term external debt and GDP growth rate for 27 Latin American and Caribbean countries over a period of 1970-2003 and found an evidence of granger causality in 13 countries.

To sum up, the prime objective of the reviewed studies was to explore the empirical evidence regarding the dynamic relationship between external debt and economic growth. Most of the research done in this area used a broader data set defined over a longer time series than others, with only a few studies focused on country specific analysis. Overall, majority of the studies came up with a conclusion that higher level of external debt is associated with a relatively lower level of economic growth; with only few studies that found no conclusive evidence supporting these hypotheses.

## III. Data Description

This paper observes 70 developing economies[2] for thirty six years, covering period from 1976 to 2011. Prime source of macro variables i.e. growth rate of GNI per capita, total external debt to GNI, total debt services to export ratio, terms of trade, inflation, official exchange rate, openness, public and publicly guaranteed debt as percent of GNI and interest rate spread is "World Development Indicators 2013" (WDI 2013) of World Bank. The data for the total investment, public investment and private

[2] List of countries is presented in Table 2 in Annexure

investment is collected from "International Finance Corporation" (IFC) & World Bank (Everhart *et al*. 2001) and World Development Indicators (WDI).

## IV. External Debt and Economic Growth

As discussed in earlier section, higher external debt service emanating from growing external debt stock eats up the fiscal revenues and leaves the lesser space with the fiscal authorities to run country. Developing countries, therefore, either try to tap more resources from abroad to maintain economic stability or slash their capital expenditure, which in turn hampers the economic growth. In order to validate this hypothesis, we observed a sample of 70 developing countries for 36 years (1976 – 2011). Empirical investigation is done by using linear panel data model of fixed effects and random effects. Baseline linear panel model of random effects is defined as:

$$G_{it} = \alpha + E_{it}\beta + I_{it}\,\emptyset + M_{it}\,\gamma + \mathcal{E}_{it} \qquad (1)$$

Where $G_{it}$ is growth rate of per capital GNI for *i*th country at year *t*. While, $E_{it}$ is the set of external debt indicators that includes external debt stock as percent of GNI, external debt stock as percent of exports, external debt service as percent of GNI, $I_{it}$ is the set of investment variables that includes foreign direct investment as percent of GNI, fixed capital formation as percent of GNI, private capital formation as percent of GNI, public fixed capital formation as percent of GNI and $M_{it}$ is the set of macroeconomic variables consisting of inflation, exchange rate movements and openness. To capture the effect of individual heterogeneity across the sample countries, we use the same set of variables to estimate fixed effect model of linear panel data model as:

$$G_{it} = \alpha_i + E_{it}\beta + I_{it}\,\emptyset + M_{it}\,\gamma + \mathcal{E}_{it} \qquad (2)$$

Where $\alpha_i$ captures country fixed effects. We use Hausman test to decide between using the fixed effect model and the random effect model. Value of Hausman test Prob > $chi^2$ is reported in Table 3 in Annexure. In addition, we used robust standard errors to control for heteroskedasticity.

The results obtained from above models are reported in table 2. These results are consistent with the debt overhang hypothesis which states that current stock of external debt will slow down the economic growth. The coefficients are highly significant at 1 percent and depict an inverse relationship between external debt to

GNI and growth rate of per capita GNI for the developing countries. Estimates predict that 10 percent increase in external debt to GNI will reduce the per capita GNI growth by 0.2 percent. While the coefficient of external debt stock to exports ratio has little impact. However, the impact of external debt services that hits the current expenditure and foreign exchange reserves is quite strong. We find a strong inverse relationship between external debt services and growth rate of per capita GNI. Our estimates show that on average 10 percent rise in current external debt servicing to GNI ratio reduces per capita GNI by 5.2 percent. These estimates are significant at 1 percent.

Addressing the role of capital formation in economic growth, we considered fixed capital formation by both the public and private agents in the economy as well as the foreign direct investment. Our results show that fixed capital formation along with FDI plays an important role in promoting economic growth. We find a strong positive relationship between FDI and per capita GNI growth rate. Our estimates show that on average 10 percent increase in FDI helps per capita GNI grow by 2.6 percent. While fixed capital formation and per capita GNI growth are closely related. We find that a 10 percent increase in fixed capital formation leads to an increase of 1.1 percent in per capita GNI growth rate. These estimates are significant at 1 percent and are further supported when the effect of both the public and private investment is analyzed separately. We find that contribution of private investment is larger in economic growth than the public investment. A 10 percent rise in fixed capital formation by the private agents helps the economy grow by 1.08 percent while, this impact is 0.89 percent for the fixed capital formation by the public agents.

While analyzing the macroeconomic indicators, we find a minimal impact of exchange rate and inflation on economic growth. These results are also significant and are in line with the theory (see Table 3). However, the effect of openness is relatively strong. We find that a 10 percent increase in openness promotes economic growth by 0.2 percent. One possible reason for these results can be the difference between small open economies versus the large open economies. Developing countries that are stuck up with higher external debt may not necessarily reap the full benefits of trade.

In the light of above discussion and empirical results, we can infer that external debt has long run implications for the economic growth.

## V. External Debt and Private Investment

According to debt overhang theory, when economies have higher external debt to GNI ratio, they may find relatively less funds available to provide an environment

conducive for business and promote investment, which further deteriorates the current level of economic growth. "The liquidity constraint hypothesis" also imposes the same constraint emphasizing on crowding out impact. It states that an increase in external debt servicing leaves less avenues for developing economies to service their debt, which, therefore, affect their ability to borrow further from external resources, putting pressure on domestic borrowing and leading to crowding out. Therefore, a reduction in current debt service should promote current investment for any given level of future indebtedness (Cohen 1993). Our results are consistent with the liquidity constraint hypothesis, and exhibit inverse relationship between external debt indicators and the level of private investment.

To observe the long run relationship between external debt and level of private investment we used linear panel data models of fixed effects and random effects. Baseline linear panel model of random effects is defined as:

$$PI_{it} = \alpha + E_{it}\beta + M_{it}\gamma + \mathcal{E}_{it} \quad (3)$$

Where $PI_{it}$ is private investment to GNI ratio of *i*th country at year *t*. While, $E_{it}$ is the set of external debt indicators that includes external debt stock as percent of GNI, external debt service as percent of exports, external debt service as percent of GNI, and $M_{it}$ is the set of macroeconomic variables consisting of foreign direct investment as percent of GNI, inflation, exchange rate movements and openness. To capture the effect of individual heterogeneity across the sample countries, we use the same set of variables to estimate fixed effect model of linear panel data model as:

$$PI_{it} = \alpha_i + E_{it}\beta + M_{it}\gamma + \mathcal{E}_{it} \quad (4)$$

Where $\alpha_i$ captures country fixed effects. We used Hausman test to decide between using the fixed effect model and the random effect model. Value of Hausman test Prob > $chi^2$ is reported in Table 4 in Annexure. Moreover, robust standard errors are used to control for heteroskedasticity. Our estimates are in line with the theory, and we find a positive and significant relationship between GNI growth and private investment, which shows that economic agents respond to the conducive business environment. Our results are significant at 5 percent; depicting a 1 percent increase in GDP growth rate will on average encourage private investment by 0.1 percent. On the other hand, terms of trade that captures the external shocks is highly significant, stating that vulnerability of terms of trade adversely affect the level of private investment in developing countries, however, trade openness promotes private investment. The estimates suggest that on average 10 percent increase in openness

(the ratio of exports plus imports to GDP) will lead to 0.9 percent increase in private investment.

Claessens *et al*. (1996) believed that "*if debt will exceed the country's repayment ability with some probability in the future, expected debt service is likely to be an increasing function of the country's output level. Thus some of the returns from investing in the domestic economy are effectively 'taxed' away by existing foreign creditors and investment by domestic and new foreign investors, is discouraged*." Our results support this hypothesis, proving that the stock of previous external debt is likely to deteriorate private investment and will lead to crowding out. The estimates suggests that on average 10 percent increase in stock of external debt to GNI ratio will decrease private investment by 0.1 percent. Moreover this impact is adverse for the rise in external debt servicing. We find that with a one percent increase in external debt services to GNI ratio, private investment deteriorates by 0.24 percent, while this impact is 0.17 in response to an increase in external debt servicing to exports ratio. Our estimates are significant at 1 percent and are consistent with the liquidity constraint hypothesis. However, the role of FDI in promoting private investment is limited.

## VI. Conclusion and Policy Recommendations

This paper explores the long run linkage between economic growth and external debt indicators investigating debt overhang theory and the liquidity constraint hypothesis. Findings of this paper are consistent with the theory and we find a strong negative impact of external debt and external debt servicing on per capita GNI growth. In addition, we find out strong evidence that fixed capital formation contributes to economic well being.

Further focusing on the perspective of mobilization of private investment in developing countries, our model suggests that higher GDP growth rate attracts private investment and help mobilizing resources towards investment. While external debt stock to GNI is inversely related to the level of private investment in developing economies. Debt servicing to GNI reduces the economic growth, and crowed out the private sector, while openness helps these developing economies to grow.

Findings of this paper suggests that developing countries need to mobilize enough resources so that they can, not only meet their debt service obligations on time and have an access to tap the external resources, but also have resources to mobilize their private investment. External debt, if not sustainable, may adversely affect the

economic growth which will ultimately dampen the fixed capital formation by the economic agents including the private sector. Developing economies, therefore, need to channelize their external resources to enhance productivity, so that it can help creating new opportunities for investment and attract more investors to their countries.

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| Author | Dependent Variable | Significant Explanatory Variables (Sign) | Countries Covered | Time Period |
|---|---|---|---|---|
| Khorsheed Chowdhury (1994) | GDP<br>Capital<br>Debt | Capital (+), K-square (-)<br>GDP (+), Debt payment(-), Debt(+),inflation (-)Interest(-)<br>GDP(+), Debt-1(+), Interest (+), Agri-labor(-) | Asian and Pacific Countries | 1970-88 |
| Gerald Scott (1994) | Log percapita GNP<br>Log per capita consumption | Log Exports (+), Log Domestic Capital (+), Technology(-)<br>Log capita imports (+), Log Exp(+), | 31 sub-Saharan African countries | 1980-87 |
| Milton A. lyoha (1999) | Log of GDP<br>per capita gross domestic investment | Log Labor (+), Per capita Income (+)<br>debt-income ratio and debt service ratio (+), Bedt overhang (-), crowding out (-) | sub-Saharan African countries | 1970-1994 |
| Maureen Were (2001) | GDP growth Rate<br>Private Investment | Inflation (-), Inflation t-1 (+),Real public investment as a ratio of GDP (+),Real public investment as a ratio of GDP t-1(-), Private Investment (+), Fiscal deficit/GDP (-), Human Capital Development (+), Debt/GDP(-), Debt/GDPt-1(-),Debt Svc to exp (+), Debt/Tot(+)<br>Inflation (-), Debt/GDP (+),lag(-), interest(-),debt svc to expt-1 (-) | Keyna | 1970-1995 |
| Alfredo Schclarek (2004) | growth rate of GDP per capita, the TFP growth rate, the capital, accumulation growth rate per capita, and the private savings rate | total external debt (-), Public external debt (-) | 59 developing countries and 24 industrial countries | 1970 -2002 |
| Mutasim Ahmed Abdelmawla Mohamed (2005) | real GDP annual growth rate | Inflation(-), Annual Growth rate of External Debt/GDP(-), Annual Growth rate of real exports (+) | Sudan | 1978- – 2001 |
| Roberto S. Mariano, Delano Villanueva (2006) | Change in Spread/Change in Debt-to-GDP | Optimal saving rate, Gross external Debt/GDP, Net External Debt/GDP, Per capita GDP growth, Yrs to double PCI | Phillipines (used GoalSeek) | 2000 – 2003 |
| Adepoju, Adenike Adebusola, Salau, Adekunle Sheu , Obayelu, Abiodun Elijah (2007) | Data analysis | raw data analysis only | Nigeria | 1962-2006 |
| T.K. Jayaraman, Evan Lau (2008) | Real GDP | External Debt (+), Exports (+), Budget Deficit (-) {significant at 3rd lag} | 14 Pacific Island Countries | 1988–2004 |
| Abid Hameed,Hammad Ashraf, Muhammed Ali Chaudhary (2008) | % change in GDP | Debt svc | Pakistan | 1970-2003 |
| Hector C. Butts (2009) | Short term external Debt, GDP | Found granger causality in 13 countries | 27 Latin American and Caribbean countries | 1970–2003 |
| ERDAL KARAGOL | debt service, long-term capital inflows and economic growth | debt service (-), lag of Debt service (-), Exchange rate (-), exports (+) | Turkey | 1959-1996 |

| **Table 2: List of Countries** | | | | | |
|---|---|---|---|---|---|
| S.No | Name of Country | S.No | Name of Country | S.No | Name of Country |
| 1 | Algeria | 26 | Gabon | 51 | Nepal |
| 2 | Argentina | 27 | Gambia, The | 52 | Nicaragua |
| 3 | Bangladesh | 28 | Ghana | 53 | Pakistan |
| 4 | Benin | 29 | Grenada | 54 | Panama |
| 5 | Botswana | 30 | Guatemala | 55 | Peru |
| 6 | Brazil | 31 | Guinea | 56 | Philippines |
| 7 | Bulgaria | 32 | Guyana | 57 | Rwanda |
| 8 | Burkina Faso | 33 | Honduras | 58 | Senegal |
| 9 | Burundi | 34 | India | 59 | Sierra Leone |
| 10 | Cameroon | 35 | Indonesia | 60 | Sri Lanka |
| 11 | Cape Verde | 36 | Iran, Islamic Rep. | 61 | Sudan |
| 12 | Central African Republic | 37 | Jamaica | 62 | Syrian Arab Republic |
| 13 | Chad | 38 | Jordan | 63 | Tanzania |
| 14 | China | 39 | Kenya | 64 | Thailand |
| 15 | Colombia | 40 | Lebanon | 65 | Togo |
| 16 | Comoros | 41 | Lesotho | 66 | Tunisia |
| 17 | Congo, Dem. Rep. | 42 | Madagascar | 67 | Turkey |
| 18 | Congo, Rep. | 43 | Malawi | 68 | Uruguay |
| 19 | Costa Rica | 44 | Malaysia | 69 | Zambia |
| 20 | Cote d'Ivoire | 45 | Mali | 70 | Zimbabwe |
| 21 | Ecuador | 46 | Mauritania | | |
| 22 | Egypt, Arab Rep. | 47 | Mauritius | | |
| 23 | El Salvador | 48 | Mexico | | |
| 24 | Ethiopia | 49 | Morocco | | |
| 25 | Fiji | 50 | Mozambique | | |

**Table 3: Effect of External Debt on Economic Growth**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| External Debt Stock- GNI | -0.0150*** | -0.0240*** | -0.0229*** | -0.0236*** | -0.0143*** | | | | | |
| | (0.0042) | (0.0041) | (0.0044) | (0.0061) | (0.0050) | | | | | |
| External Debt Stock- Exports | | | | | | -0.00147* | | | | |
| | | | | | | (0.0008) | | | | |
| External Debt Service - GNI | | | | | | | -0.541*** | -0.561*** | -0.459*** | -0.579*** |
| | | | | | | | (0.0916) | (0.0906) | (0.1140) | (0.0915) |
| Foreign Direct Investment - GNI | | | 0.293*** | 0.263** | 0.264*** | 0.225*** | | 0.289*** | 0.262** | 0.256*** |
| | | | (0.0847) | (0.1050) | (0.0819) | (0.0845) | | (0.0880) | (0.1120) | (0.0830) |
| Fixed Capital Formation - GNI | | | 0.0999*** | | | | | 0.117*** | | |
| | | | (0.0332) | | | | | (0.0347) | | |
| Private Capital Formation - GNI | | | | 0.104** | 0.115*** | 0.0921** | | | 0.0976** | 0.133*** |
| | | | | (0.0468) | (0.0358) | (0.0454) | | | (0.0492) | (0.0365) |
| Public Fixed Capital Formation - GNI | | | | | 0.0997** | 0.0542 | | | | 0.112** |
| | | | | | (0.0438) | (0.0356) | | | | (0.0440) |
| Inflation | | -0.0006** | -0.0006** | -0.0006** | | | -0.0008*** | -0.0008*** | -0.0007*** | |
| | | (0.0002) | (0.0002) | (0.0002) | | | (0.0002) | (0.0002) | (0.0002) | |
| Exchange Rate | | 0.0001* | 0.0001* | 0.0001** | | | 0.0001* | 0.0001* | 0.0001*** | |
| | | (0.0001) | (0.0000) | (0.0001) | | | (0.0001) | (0.0001) | (0.0001) | |
| Openness | | 0.0227*** | 0.0101 | 0.0260** | | | 0.0222*** | 0.00782 | 0.0253** | |
| | | (0.0066) | (0.0069) | (0.0107) | | | (0.0068) | (0.0070) | (0.0111) | |
| Constant | 2.590*** | 2.025*** | 0.0912 | -0.0352 | -0.109 | 0.117 | 1.583*** | -0.523 | -0.526 | -0.282 |
| | (0.3220) | (0.4540) | (0.7430) | (0.8810) | (0.8000) | (0.8050) | (0.4520) | (0.6900) | (0.8180) | (0.7150) |
| Number of Observations | 2059 | 1822 | 1806 | 1601 | 1758 | 1598 | 1818 | 1802 | 1597 | 1754 |
| Estimation Technique | RE | RE | RE | FE | RE | RE | RE | RE | FE | RE |
| Number of Countries | 66 | 65 | 65 | 64 | 65 | 64 | 65 | 65 | 64 | 65 |
| Hausman Test (Prob>chi2) | 0.64 | 0.22 | 0.16 | 0.01 | 0.74 | 0.14 | 0.14 | 0.48 | 0.03 | 0.97 |

Robust standard errors are in parentheses; *** p<0.01, ** p<0.05, * p<0.1

| Table 4: Role of External Debt in Fixed Capital Formation of the Private Sector | | | | | | | |
|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| GNI Growth Rate | 0.0698** | 0.0696** | 0.0506* | 0.0490* | | | |
| | (0.0355) | (0.0270) | (0.0262) | (0.0263) | | | |
| Lending Interest Rate | -0.0016** | -0.0018* | -0.0018* | -0.0018* | -0.0015*** | -0.0012*** | -0.0011*** |
| | (0.0008) | (0.0011) | (0.0011) | (0.0011) | (0.0004) | (0.0002) | (0.0004) |
| External Debt Stock- GNI | -0.0088** | | | | | | |
| | (0.0036) | | | | | | |
| External Debt Service - GNI | | -0.294*** | -0.212** | -0.214** | | | |
| | | (0.0998) | (0.0971) | (0.0972) | | | |
| External Debt Service - Exports | | | | | -0.215*** | -0.150*** | -0.137*** |
| | | | | | (0.0337) | (0.0346) | (0.0346) |
| openness | | | 0.0928*** | 0.0925*** | | 0.0802*** | 0.0800*** |
| | | | (0.0104) | (0.0104) | | (0.0127) | (0.0126) |
| Foreign Direct Investment - GNI | | | | 0.0539 | | | 0.154* |
| | | | | (0.0685) | | | (0.0872) |
| Constant | 14.75*** | 15.43*** | 10.13*** | 10.09*** | 15.62*** | 11.31*** | 10.55*** |
| | (0.5780) | (0.3060) | (0.6630) | (0.6650) | (0.6700) | (0.8250) | (0.8220) |
| Observations | 1,246 | 1,246 | 1,246 | 1,246 | 1,341 | 1,341 | 1,341 |
| Estimation Technique | RE | FE | FE | FE | RE | FE | RE |
| Number of Countries | 62 | 62 | 62 | 62 | 66 | 66 | 66 |
| Hausman Test (Prob>chi2) | 0.97 | 0.05 | 0.01 | 0.01 | 0.68 | 0.01 | 0.63 |

Robust standard errors are in parentheses; *** p<0.01, ** p<0.05, * p<0.1