

Public Debt Burden and Corruption in Developing Countries

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Abstract—The burden of public debt and the spread of corruption are economic development issues because they can hinder growth in the long term. However, based on theories and empirical reviews, the influence of both on economic growth is still ambiguous and inconclusive, because they can decrease or increase economic growth. This study aims to investigate the dynamic effect of public debt burden and corruption on economic growth in developing countries - where they have difficulty paying debt installments and the prevalence of corruption is higher compared to developed countries. Therefore, in this study the Pooled Mean Group-Autoregressive Distributed Lag (PMG-ARDL) method was used to see: the relationship between economic growth and public debt service and corruption in the long term, short-term adjustments of each variable to long-term balance (cointegration), and to see how fast these variables adjust to the long-term if a shock occurs. We use panel data from 41 developing countries, the observation period is from 2002 to 2021. The results show that the public debt service is detrimental to economic growth in both the short and long term. Corruption harms economic growth in the long term, but can increase it in the short term. Corruption exacerbates the negative impact of public debt service on economic growth in the long term.

Keywords: Public Debt Service; Corruption; Panel ARDL; Developing Countries; Economic Development

1. INTRODUCTION

The burden of public debt and the spread of corruption are of special concern in economic development issues, globally, because they can hinder growth in the long term (IMF, 2021; TI, 2020). Especially in developing countries, both are bigger problems compared to developed countries. Developing countries with minimal budgets must be faced with two choices, financing development or paying debt installments. This is made worse by budget leaks due to corruption conducted by his government.

UNCTAD (2023) notes that the total public debt of developing countries increased from 35% of GDP in 2010 to 60% in 2021. Likewise, external public debt, namely the share of government debt to foreign creditors, increased from 19% of GDP to 29% GDP in 2021. The challenge of high levels of external public debt, which makes developing countries more vulnerable to external shocks, is that when global financial conditions change or international investors become more risk-averse, the cost of debt can increase suddenly. Also when a currency devalues, debt payments in foreign currency can skyrocket, leaving less money for development spending. Public debt has costs especially for developing countries, the costs incurred are greater than the benefits. The main burden of increasing debt is debt servicing, which consists of amortization payments (principal debt) and interest rates. If debt continues to increase or interest rates increase, then debt installment payments will also increase.

Economic and financial crimes such as corruption continue to increase despite harsh policy measures implemented in both developed and developing countries (Saddiq & Abu Bakar, 2019). Global Financial Integrity (2019) estimates that illicit financial flows from developing countries reached almost 1 trillion dollars in 2014, usually ending up in banks in developed countries such as the United States and the United Kingdom, as well as in tax havens such as Switzerland, the British Virgin Islands, or Singapore. As a form of corruption, bribery occurs every year in developing and developed countries, estimated at 1.5 trillion to 2 trillion dollars, or around 2 percent of global GDP.

However, empirically, the impact of public debt and corruption on economic growth is still a matter of long debate, many studies show that the impact of public debt and corruption on economic growth is a "double-edged sword", can be "good or bad". The impact of public debt on economic growth empirically shows a positive influence (Hilton, 2021; Yusuf & Mohd, 2021) or it can also have a negative impact (Law et al., 2021; Yusuf & Mohd, 2021). Economists differ in their views on how public debt affects economic growth. The majority of economists agree to the 'conventional' theory which states that the relationship between public debt and economic growth is through capital accumulation (investment); in the short term, aggregate output may be increased, but in the long term, investment is reduced, and therefore economic growth is harmed. Disagreeing with this view, the 'debt neutrality theory' or 'Ricardian equality' states that economic growth will not be affected by public debt, because people prepare to face future burdens caused by public debt, and as a result, they save a certain amount of money and make an investment.

The majority of previous researchers support that there is a significant negative impact of corruption on economic growth (Al Qudah et al., 2020; Dokas et al., 2023; Erum & Hussain, 2019; Gründler & Potrafke, 2019). Many empirical findings show the indirect negative impact of corruption on economic growth through transmission channels, by changing the impact of growth determinants (Beyaert et al., 2023). Most studies find that corruption reduces growth indirectly by inhibiting investment (Dokas et al., 2023; Gründler & Potrafke, 2019) because it creates investment uncertainty and doubt among investors and reduces return on investment (Cieřlik & Goczek, 2018). Several studies find that corruption reduces economic growth by increasing the inflation rate (Gründler & Potrafke, 2019), imposing higher tax rates, reducing innovation (Dokas et al., 2023), reducing human resources, and increasing political instability. On the other hand, evidence has also been found of the positive influence of corruption on economic growth (Trabelsi & Trabelsi, 2021).

Two hypotheses can explain how corruption affects economic growth: “sand the wheels” and “grease the wheels”. The “sand the wheels” hypothesis argues that corruption reduces economic growth because corruption inhibits production efficiency. In contrast, the “grease the wheels” hypothesis argues that corruption increases economic growth when it avoids inefficient regulations in an overly bureaucratized country, corruption ensures the continuity and success of many investment projects that could not be implemented if corruption were not committed.

Each issue has been analyzed empirically, but there is still limited research investigating the impact of both on economic growth. Ibrahim (2021) investigated the impact of high levels of corruption on public debt and economic growth in the 20 most corrupt developing countries, showing that corruption increases public debt and corruption harms economic growth. Seeing the gap in the literature, this research tries to analyze the dynamic impact of public debt service and level of corruption on economic growth in developing countries. Based on the formulation of the research problem and the study of empirical findings that have been explained, our hypotheses are: (H1) Public debt service harms economic growth in developing countries; (H2) Corruption harms economic growth in developing countries.

For this reason, we use the panel ARDL method. The scope of the research is 41 developing countries. The observation period is twenty years (2002 to 2021). By knowing the impact of public debt burden and corruption on economic growth in developing countries, it is hoped that this can have implications for designing appropriate policies to encourage sustainable economic development in countries with limited development budgets.

2. RESEARCH METHODS

2.1 Conceptual Framework

The impact of public debt on economic growth is explained by several theories. The 'conventional' theory states that the relationship between public debt and economic growth is through capital accumulation (investment); in the short term, aggregate output may be increased, but in the long term, investment is reduced, and therefore economic growth is harmed. This view is also supported by the 'Debt Overhang Hypothesis' which asserts that a continuous increase in debt accumulation will reduce the level of economic growth as a result of increasing taxes on companies. Standard growth models also predict that higher public debt leads to slower growth. Disagreeing with both views, the 'debt neutrality theory' or 'Ricardian equality' states that economic growth will not be affected by public debt, because people are prepared to face future burdens caused by public debt, and as a result, they save some money and making investments. Although there is still debate, we estimate the impact of public debt on economic growth as follows: (H1) Public debt service harms economic growth.

There are two hypotheses that explain how corruption is expected to affect economic growth: “sand the wheels” and “grease the wheels”. The “sanding the wheel” hypothesis by Paolo Mauro says that corruption reduces economic growth because it inhibits production efficiency. In contrast, the “grease the wheels” hypothesis political scientist Samuel P. Huntington in his book "Political Order in Changing Societies" says that corruption can function as a lubricant for the slow and rigid wheels of bureaucracy in countries with institutions weak, allowing administrative processes to run more smoothly even if illegally. When regulations for starting a business are tightened (such as investment approvals, business establishments, patent and trademark permits), bribery by business people of politicians and bureaucrats is likely to increase economic activity (Gründler & Potrafke, 2019). Corruption can have a good or bad impact on a country's economic growth. Corruption has a good impact on "grease the wheel", but it seems that the bad impact of "sand the wheel" corruption is greater because corruption inhibits investment, inhibits production efficiency and innovation, increase inflation, imposing higher tax rates, reducing human capital, and increasing political instability – which ultimately harms economic growth (Dokas et al., 2023; Erum & Hussain, 2019; Gründler & Potrafke, 2019). Thus, the hypothesis built is: (H2) Corruption harms economic growth.

To estimate the impact of corruption and public debt service on economic growth, some factors determining economic growth should not be ignored because they are crucial, these factors are government spending, capital formation, trade openness, and population growth which have also been used in previous studies as control variables.

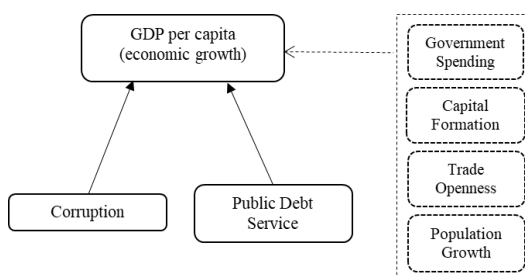


Figure 1. Conceptual Framework

2.2 Data and Variables

This research uses panel data (across countries and years) from 41 developing countries, with 20 years observation period, from 2002-2021. Based on the World Bank's classification, developing countries are a group of low-income economies

(\$1,135 or less) and lower-middle income economies (\$1,136-\$4,465) countries. The forty-one sample countries are: Algeria, Angola, Bangladesh, Benin, Bolivia, Burkina Faso, Burundi, Cameroon, Chad, Comoros, Congo Republic, El Salvador, Gambia, Ghana, Guinea, Guinea-Bissau, Haiti, Honduras, India, Indonesia, Kenya, Kyrgyz Republic, Lebanon, Madagascar, Mali, Mauritania, Mongolia, Morocco, Nepal, Nicaragua, Niger, Pakistan, Senegal, Sierra Leone, Sudan, Togo, Tunisia, Uganda, Ukraine, Vanuatu, and Zimbabwe.

This research uses GDP per capita as the dependent variable, 2 interest variables are Public Debt Service and Corruption Index, and 4 control variables which are important factors determining economic growth which are also consistent with the classical and neo-classical growth equations are: Government Spending, Capital Formation, Trade Openness, and Population Growth (Erum & Hussain, 2019). GDP per capita (constant US\$ 2015 data) is sourced from World Development Indicators (WDI) World Bank, this variable is then converted into natural logarithm form (**LNGDPC**). The IMF defines public debt as state debt or government debt. We use total debt service (**DEBTSERV**) – percentage of exports of goods, services and primary income as an indicator of the public debt burden, sourced from World Bank. Total debt payments are the sum of principal and interest payments actually paid in currency, goods, or services on long-term debt, interest paid on short-term debt, and repayment (buybacks and charges). Corruption is defined as “the abuse of public office for private gain” (IMF, 2018). In this research, the Corruption Index (**CRRPT**) comes from Control of Corruption Index data from the World Bank, namely the control of corruption score in a country/government (-2.5 most corrupt to +2.5 least corrupt) which is then converted to 0 (low corruption) to 100 (high corruption). Government Spending (**GOVT**) is the government's general final consumption expenditure as percentage of GDP. Capital Formation (**CAPT**) uses Gross Fixed Capital Formation data as percentage of GDP. Trade Openness (**OPEN**) is total exports and imports as percentage of GDP. Population Growth (**POPGR**) is the annual population growth rate expressed as a percentage. All these variables are sourced from the World Bank.

2.3 Econometric Method and Model Specification

This research uses Pooled Mean Group-Autoregressive Distributed Lag (PMG-ARDL) estimation method developed by Hashem Pesaran to estimate the long-term relationship between public debt, corruption, and economic growth. This model is a consistent and efficient estimation method because this method includes lags on the dependent and independent variables which will eliminate endogeneity problems – the correlation between the independent variables and the error term in the model. This method can also avoid the problem of non-stationary data because this method accepts variables that have integration at levels I(0) (level) and I(1) (first difference) but cannot be used on variables I(2) (second difference)

Before using PMG-ARDL, it is necessary to first test the stationarity of the data using the panel unit root test to prevent the entry of stationary variables I(2) into the regression. The stationarity tests used in this research are Im, Pesaran and Shin (IPS) and Augmented Dickey Fuller-Fisher (ADF-Fisher). The second stage is a cross-sectional dependency test. The existence of cross-section dependence between series will provide biased and inconsistent empirical results. This research requires examining cross-section dependencies as developing countries are connected through trade, globalization, and other networks and produce spillover effects. This study used the Breusch-Pagan LM test, the Pesaran LM scale test and the Pesaran CD test to ensure cross-sectional dependence. The main empirical model in this research is as follows:

$$\begin{aligned} \Delta \text{LNGDPC}_{it} = & c_0 + \theta_1 \text{LNGDPC}_{it-j} + \theta_2 \text{DEBTSERV}_{it-j} + \theta_3 \text{CRRPT}_{it-j} + \theta_4 \text{GOVT}_{it-j} + \theta_5 \text{CAPT}_{it-j} \\ & + \theta_6 \text{OPEN}_{it-j} + \theta_7 \text{POPGR}_{it-j} + \sum_{i=1}^n \alpha_{1i} \Delta \text{LNGDPC}_{it-j} + \sum_{i=1}^n \alpha_{2i} \Delta \text{DEBTSERV}_{it-j} \\ & + \sum_{i=1}^n \alpha_{3i} \Delta \text{CRRPT}_{it-j} + \sum_{i=1}^n \alpha_{4i} \Delta \text{GOVT}_{it-j} + \sum_{i=1}^n \alpha_{5i} \Delta \text{CAPT}_{it-j} \\ & + \sum_{i=1}^n \alpha_{6i} \Delta \text{OPEN}_{it-j} + \sum_{i=1}^n \alpha_{7i} \Delta \text{POPGR}_{it-j} + \varepsilon_{it} \end{aligned} \quad (1)$$

Where the symbol Δ denotes a first different operator, $i=1,2,\dots,N$ is the countries (cross-section) and $t=1,2,\dots,T$ is the time dimension, j is the time lag. **LNGDPC** is the natural logarithm of GDP per capita as the dependent variable; **DEBTSERV**, **CRRPT** as independent variables which are the variables of interest; **GOVT**, **CAPT**, **OPEN**, and **POPGR** as control variables. The coefficient θ_i shows the long-term dynamic relationship model; The coefficient α_i indicates a short-term dynamic relationship model; c_0 is a constant and ε_{it} is the error term. The selection of the optimal lag of the variables in this research is based on the Akaike Information Criterion (AIC) test by looking at the minimum value.

3. RESULTS AND DISCUSSION

3.1 Summary Statistics

We present summary statistics of data for each variable considered in this study to assess the characteristics of the data during the research period (2002-2021) in 41 developing countries, in the form of panel data with 820 observations. In the 41 developing countries that are the object of this research, the average GDP per capita is US\$ 1.561,43 with a standard deviation of US\$ 1.009,25, in natural logarithmic form the average is 7,19 with a standard deviation of 0,72. The average Public Debt Service is 13,63% with a standard deviation of 15,17%. The average Corruption Index is 65,66, indicating a

high level of corruption in developing countries (on a scale of 0-100), with a standard deviation of 8,32. The average percentage of Government Spending to GDP is 13,17% with a standard deviation of 4,41%. The average percentage of Capital Formation to GDP is 22,23% with a standard deviation of 8,53%. The average Trade Openness in the form of the percentage of total exports and imports to GDP is 65,40% with a standard deviation of 27,52%. The average annual Population Growth rate is 2,14% with a standard deviation of 1,11%. The standard deviation values for all variables (except public debt service) show values that are smaller than the average value, meaning that the data tends to be homogeneous or has a low level of deviation. Meanwhile, public debt service show that the data is heterogeneous. See Table 1 below.

Table 1. Summary Statistics of Variables

	GDP	LNGDP	DEBTSERV	CRRPT	GOVT	CAPT	OPEN	POPGR
Mean	1561.430	7.193503	13.62292	65.65904	13.17370	22.23238	65.39670	2.137410
Median	1277.544	7.176950	9.543350	66.22565	13.49370	21.13240	59.27005	2.314105
Maximum	4385.112	9.109100	134.8028	81.94230	31.34430	78.00090	156.8618	9.971970
Minimum	263.3610	5.573500	0.382100	40.47180	2.047100	2.000400	4.127500	-2.879.870
Std. Dev.	1009.245	0.716378	15.16763	8.312381	4.405084	8.525885	27.52429	1.105180
Observations	820	820	820	820	820	820	820	820

The highest average GDP per Capita is owned by Algeria at US\$ 3.926,21 and the lowest is owned by Burundi at 292,07. The highest average public debt service level is owned by Lebanon at 53,99% and the lowest level is owned by Vanuatu at 2,52%. The highest average corruption level is owned by Chad at 78,13 poin and the lowest level is owned by Vanuatu at 47,29 poin. The highest average government spending is owned by Burundi at 22.24% and the lowest level is owned by Bangladesh at 5.43%. The highest average capital formation is owned by Congo Republic at 38.64% and the lowest level is owned by Zimbabwe at 9.39%. The highest average trade openness is owned by Congo Republic at 115.53% and the lowest level is owned by Sudan at 25.09%. The highest average population growth is owned by Niger at 3.71% and the lowest level is owned by Ukraine at -0.52% – the only country whose population growth always decreases every year. To illustrate the condition of GDP per capita, level of public debt service, and level of corruption in 41 developing countries, the graphs below can show it (Figure 2-4).

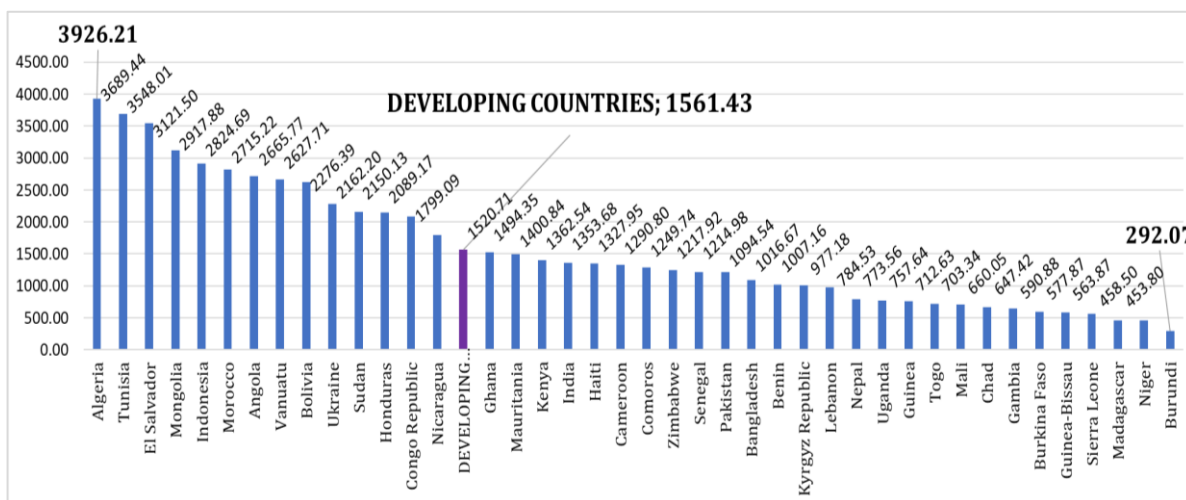


Figure 2. Average GDP per Capita in 41 Developing Countries (2002-2021)

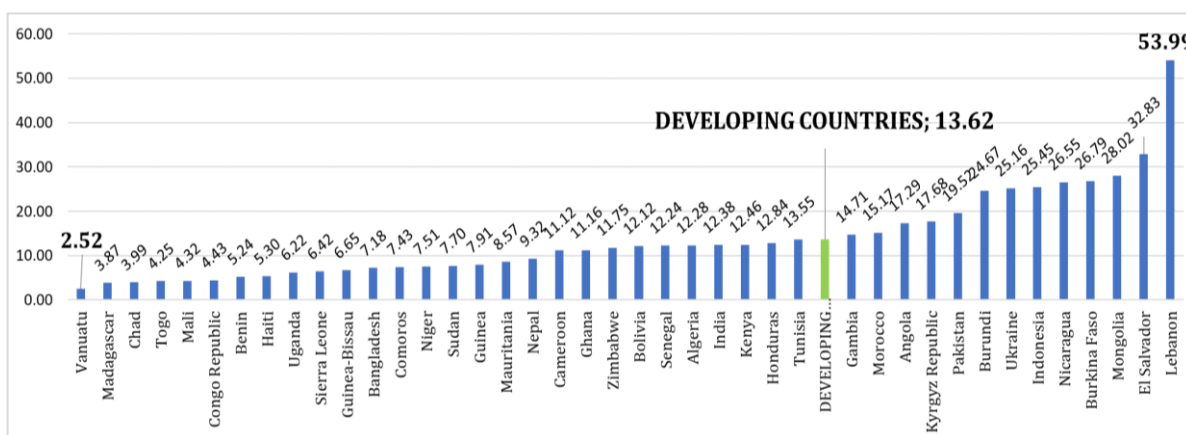


Figure 3. Average Public Debt Service in 41 Developing Countries (2002-2021)

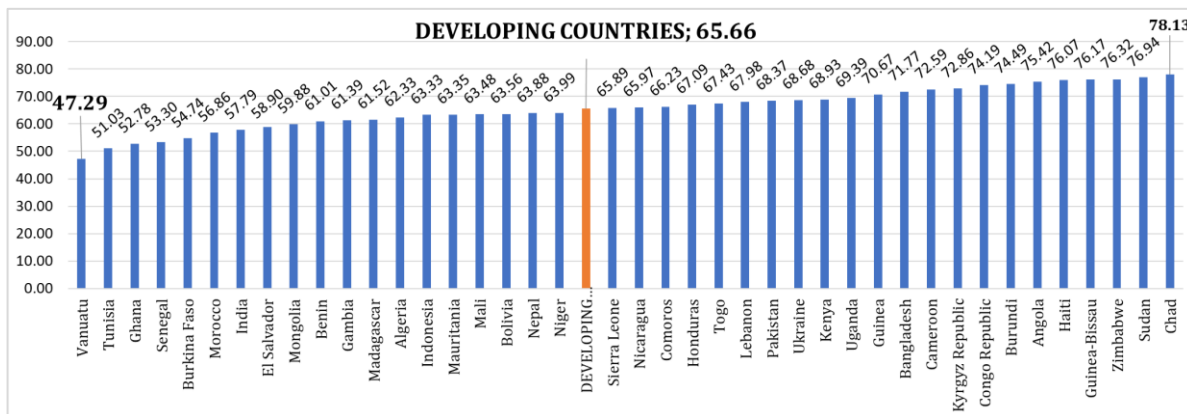


Figure 4. Average Level of Corruption in 41 Developing Countries (2002-2021)

3.2 Panel Unit Root and Cross-Sectional Dependency Test Result

Table 2. Panel Unit Root Stationarity Test Results

Variables	Im, Pesaran and Shin (IPS) W-Stat		ADF Fisher Chi-square		Order of Integration
	Level	1 st Difference	Level	1 st Difference	
LNGDPC	108.070	-6.61234***	848.663	184.268***	I(1)
DEBTSERV	-0.96527	-12.0648***	135.671***	311.808***	I(1)
CRRPT	-1.45173*	-11.2671***	110.188**	283.170***	I(0)
GOVT	-0.72687	-11.8418***	99.5560*	297.171***	I(1)
CAPT	-2.07595**	-11.8815***	125.353*	295.174***	I(0)
OPEN	-2.82519***	-12.7116***	116.876***	315.872***	I(0)
POPGR	0.87797	-7.03712***	965.152	213.659***	I(1)

Note: Exogenous variables: Individual effects-non trend; User-specified lags: 1; Coefficients marked ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Table 2 above shows two panel unit root test results (IPS and ADF-Fisher). There are three variables that are stationary at level I(0), that are CRRPT, CAPT, OPEN, while four variables that are LNGDPC, DEBTSERV, GOVT, and POPGR are stationary at the first order (1st difference). Statistically, at a significance level of 1%, all variables have been declared stationary at first order I(1). Because the highest level of integration is first order I(1) and there is no I(2), PMG-ARDL is suitable for testing cointegration between variables.

From Table 3 below, it is known that the results of the correlation test with the residual cross-section dependence test have an autocorrelation problem because the probability values of the three statistical tests reject the null hypothesis of cross-sectional independence with a significance below 1%, thus validating the existence of cross-sectional dependence between 41 developing countries.

Table 3. Residual Cross-Section Dependence Test

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	3193.812	820	0.0000
Pesaran scaled LM	58.61712		0.0000
Pesaran CD	16.13012		0.0000

3.3 Long-term and Short-term Estimation Result by PMG-ARDL Method

Table 4. PMG-ARDL Estimation Results

Dependent: LNGDPC	Without Corruption (restricted model)	With Corruption (main model)
Long Run Equation		
DEBTSERV	-0.002067** (0.000998)	-0.002356** (0.000951)
CRRPT	-	-0.012953*** (0.002260)
GOVT	0.036681*** (0.005106)	0.018690*** (0.002717)
CAPT	0.053364*** (0.004414)	0.011333*** (0.001295)
OPEN	0.002573** (0.001104)	0.001414** (0.000688)
POPGR	0.052787* (0.031861)	0.217784*** (0.022636)
Short Run Equation		
ECT (-1)	-0.058209*** (0.012524)	-0.119127*** (0.030357)
LNGDPC(-1)	0.051431 (0.058826)	0.070938 (0.066297)

Dependent: LNGDPC	Without Corruption (restricted model)	With Corruption (main model)
Δ DEBTSERV	-0.001900** (0.000855)	-0.001868** (0.000906)
Δ CRRPT	-	0.001948** (0.000885)
Δ GOVT	-0.008663*** (0.001653)	-0.008028*** (0.001766)
Δ CAPT	0.001579* (0.000936)	0.002709*** (0.001013)
Δ OPEN	0.000235 (0.000276)	-3.96E-05 (0.000278)
Δ POPGR	0.025960 (0.035946)	0.013058 (0.043711)
C	0.342060*** (0.075294)	0.847817*** (0.206346)

Note: Standard errors are in parentheses. Coefficients marked ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively. The ARDL model was selected based on AIC, Without Corruption Model (2, 1, 1, 1, 1, 1), With Corruption (2, 1, 1, 1, 1, 1). Observations: 738.

The two PMG-ARDL estimation results show that the ECT coefficient is significantly negative, indicating that the model experiences short-term to long-term balance adjustments throughout the series, or it can be interpreted that ‘cointegration’ occurs. If the dependent variable experiences pressure/fluctuations/shocks, then the independent variables make adjustments to their long-term balance as quickly as the ECT value, which is also called the ‘speed of adjustment’. The speed of adjustment value in the two estimation results are -0,0582 and -0,1191 per year respectively, where the faster adjustment is found in the model when the Corruption Index variable is added. Shows that when there is a shock to economic growth (GDP per capita), in the short term, public debt service, levels of corruption, government spending, capital formation, trade openness and population growth contribute to correcting the deviation in results each year by around 5,82% and 11,91%, respectively, to become balanced again. These values indicate that the process of adjusting to unbalanced economic growth in developing countries in the 2002-2021 period is relatively ‘slow’ when facing the phenomenon of public debt burden and corruption, because the ECT value ranges from 0 to -1 (0% to 100%).

Our first hypothesis (H1) predicts that public debt service harms economic growth in 41 developing countries. This hypothesis is fully accepted, both in the long and short term, both without considering the existence of corruption and with the existence of corruption (main model). Every 1% increase in public debt service will reduce GDP per capita by -0,24% in the long term, and by -0,19% in the short term. The impact of public debt burden is worse in the long run. Our second hypothesis (H2) predicts that corruption harms economic growth – ‘sand the wheels’. In the long term, this hypothesis is proven, but in the short-term corruption can actually increase GDP per capita. However, with corruption existence (main model), the negative impact of public debt service on economic growth increases (more harmful) with a change from -0,21% to -0,24% in the long-term, but decreased by a very small margin (relatively constant at -0.19%) in the short-term.

In the long term, in both models, the four control variables are all significantly positive impact on economic growth. However, the positive impact relatively decreases when the corruption variable is included. With corruption, in the long term, the impact of government spending decreases from 3,67% to 1,87%, capital formation decreases from 5,34% to 1,13%, trade openness decreases from 0,26% to 0,14%, only population growth has a positive impact and increased from 5,28% to 21,78%. In the short term, when including the level of corruption (main model), government spending has a negative impact by -0,80%, capital formation has a positive impact of 0,27%, but trade openness and population growth have no significant impact.

3.4 Discussion

The challenge for governments in developing countries is how they can effectively manage relatively minimal budgets for productive sectors so as to increase aggregate productivity (GDP per capita). Considering that developing countries are inhabited by people who have lower and lower middle incomes, the option to raise the taxes is not recommended. The government’s action to borrow for development by taking on public debt is a way that cannot be avoided, due to budget constraints, lack of savings, difficulty raising taxes, and difficulty reducing public spending (Yusuf & Mohd, 2021). This is quite a high-risk action because public debt intended for development has high costs to repay – according to the findings, the cost of public debt reduces growth in both the short and long term. Therefore, according to the findings, capital formation (investment) is the most important factor for increasing GDP per capita in developing countries, both in the short and long term – to offset the risk of unavoidable public debt burden.

Then, developing countries tend to consider corrupt practices to be normal behaviour. Moreover, these developing countries are relatively early in the development period because generally these developing countries are former colonial countries so they are still in the process of transformation towards a professional bureaucratic system. Whether they realize it or not, this is actually a culture and habit that is very detrimental to the country. Corruption may be optimal from an individual’s perspective, but it is a non optimal activity from an economic development perspective. From the results of this research, it was found that: With corruption, the negative impact of public debt service on economic growth increases; And with corruption, the benefits of government spending, capital formation and trade openness on economic growth are reduced in the long term. From the findings, corruption may be able to increase GDP per capita in the short term, but this is a trap, because however corruption still has a direct negative impact in the long term – validating the “sand the wheels” hypothesis like the majority of previous research (Al Qudah et al., 2020; Alfada, 2019; Antoni et al., 2019).

In the long term, the four control variables are all significantly positive. From these findings we can conclude that government spending, capital formation, trade openness and population growth are still important determining factors of long-term economic growth. These four things need to be maintained and continuously improved by governments in developing countries while still anticipating acts of corruption that can reduce the benefits of these four things for economic growth.

According to (Mankiw, 2021) one of the factors that contributes to aggregate demand is government spending. If government spending increases, this will lead to an increase in aggregate demand. Especially in developing countries, the important role of government in the economy is very visible, considering the limited ability of the private sector to drive economic growth. Therefore, increasing government spending is considered crucial in achieving economic growth in developing countries.

Capital formation (or investment) involves spending to obtain capital goods with the aim of increasing living standards in the future (Mankiw, 2021). The role of capital formation is very crucial in increasing a country's economic output not only in the context of long-term growth, but also in short-term business cycles. Capital formation is the most dynamic element of GDP, connecting current conditions with the future (Mankiw, 2021). Capital formation can be sourced from within the country (domestic) or overseas investment by foreign companies. The government's efforts to seek economic development through capital formation are a safer way than receiving fresh funds from public debt. However, in a country with widespread corruption, potential investors will be very hesitant to invest their capital.

Most of the world economy is an open economy, namely exporting goods and services abroad, importing goods and services from abroad, and borrowing and lending on world capital markets (Mankiw, 2021). The developing countries in this study are also adherents of an open economy. Robert Barro argues that in the long term, trade openness can contribute to economic growth by spreading technical knowledge through importing high-tech imported goods and from the spillover impact of foreign direct investment, namely financial openness, from collaboration with sources of innovation, increasing market size to benefit from trade openness by increasing returns to scale and economies of scale.

Population growth can have a positive impact on the economy, stating that food scarcity can encourage innovation and the development of new technology, which ultimately increases production and the economy. From the findings of this research, population growth is the largest contributor to increasing GDP in developing countries, even if a country has a burden of public debt repayments and experiences budget leaks due to corruption. Therefore, developing countries do not need to fear an increase in population every year.

4. CONCLUSION

This research intends to examine the dynamic relationship between public debt service and corruption on economic growth – and showing its impact in the long term. This long-term impact is more important to pay attention to than the short-term impact, because it is continuous, not just momentary. We assumed that public debt servicing and corruption would harm economic growth based on empirical findings, and this was proven. Public debt loans taken by governments in developing countries are unavoidable despite the risk of burdensome repayment. We cannot advise developing country governments not to take on public debt because this is a fairly quick shortcut to financing development. Therefore, wherever possible the loans that have been taken must be used effectively to finance productive sectors. Although there are real threats, one of them is corruption which can divert funding from productive sectors to unproductive sectors and even the private pockets of government officials. Corruption not only harms economic growth directly, but also reduces the benefits of important factors that determine economic growth, and what is worse, these corrupt practices can increase the negative impact of government debt service on growth. Corruption is a real threat to development. However, because this corruption is expressed in the form of perceptions or index scores by independent institutions, not real figures in the form of state losses in dollars or percentage of GDP, this corruption does not appear to be a real threat. So it would be better for the competent institutions to create new indicators that are able to describe the impact of corruption more clearly, for example in dollars or as a percentage of GDP. And as a preventive measure, it is necessary to harmonize the overall perception of public officials that this corrupt practice is actually detrimental to everyone, including themselves as 'entities' (parts) of a country as a whole. If every public official position themselves as part of the public, hone their sensitivity and awareness as social beings, of course they will prioritize public satisfaction through fulfilling needs and providing optimal public goods, which of course in aggregate will be recorded in an increase in the value of GDP – the standard for determining economic development a country. The limitation of this research is that it does not consider the economic crisis due to the Covid-19 pandemic, while public debt in developing countries increased drastically during that pandemic and corruption still widespread, therefore it is hoped that further research will investigate the differences in the impact of public debt service and corruption on economic growth in periode before and during Covid-19.

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