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INFLUENCE OF PUBLIC DEBT ON ECONOMIC GROWTH IN KENYA: AN EMPIRICAL ANALYSIS

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ABSTRACT

Many countries find themselves in positions of fiscal deficits that require them to seek financing from various sources either internally or externally to bolster improvement and advancements in the economy. However, the choice of employing such financing, and to what extent demands to be at levels deemed sustainable and in close tandem with the government's budgetary needs, fiscal and public debt policies. In this regard, policymakers in national governments, monetary authorities, and international policy organizations, together with technocrats and other non-state actors need to understand the influence that public debt present fair and square of development in the economy so as to calibrate effective debt policies that balances the suitability of using deficit financing to bolster economic growth. The study therefore determined the influence of public debt on the upheld development of the Kenyan economy. A non-experimental, correlational research design approach was adopted in the assessment. Secondary time series data ranging from 1999 to 2019 was used to empirically analyze study variables.

Vector Autoregression (VAR) estimation technique for a linear time series regression model and the Johansen's multivariate cointegration test were performed to assess the short run and long-haul influence of public debt on economic growth. The results of vector autoregression (short-run) estimation between public debt and economic growth showed that the first lag of public debt on economic growth (PD, L1 = 0.620) was not as significant as compared to its second lag at 10% significance level (PD, L2 = 0.074), leading to the conclusion with 90% significance level that only the second lag of deficit financing has a causal influence on economic growth in the short-run. However, the presence of cointegration in the model variables concluded a long-run association between public debt and economic growth in the time series, implying that the variables are connected and can be consolidated in a direct design in the context of Kenya. These findings birthed the policy recommendations that the utilization of debt financing ought to be viewed as just if the normal result of debt usage will result in expanded economic and production activities intended to help various sectors of the economy which yield the highest returns. That Public Debt Management Departments ought to favor the utilization of greater amount of bilateral and multilateral advances and less of commercial loans to forestall expanded public obligation administration from watering down the feasible development paces of the economy and finally; Policy makers ought to consider focusing on the allocation of public debt to areas generally useful to improvement of the public economy to produce speedy and adequate returns in term of higher economic growth rates in order to cover the public debt.

Key Words: *Public Debt, Pubic Debt Service Cost, Nominal GDP, Kenya*

BACKGROUND OF THE STUDY

The influence that public debt continues to project on the economic growth of different countries across the world has spurred a lot of policy debate following the global financial crisis that left many governments in huge debt positions and presented serious economic risks of a future debt upheaval (Chudik, Mohaddes, Pesaran, & Raissi, 2018). Public debt constitute a significant source of income for many governments in the financing of development projects in order to impact their economy. Isibor, Babajide, Akinjare, Oladeji and Osuma (2018) assert that governments borrow from both domestic economy and external financial markets in order to smoothen development expenditures and supplement huge budget deficits from shortfalls in domestic tax revenues.

Yusuf and Said (2018) further observe that a lot of countries in Africa result to borrowing either domestically or internationally in order to finance their economic development with debt playing a critical role as a supplementary medium of funding in fostering economic growth and development. This view is shared by Esteve and Tamarit (2018) who claim that resorting to public debt as tool of fiscal policy allows individual country's authorities to stimulate the level of aggregate demand and stabilize growth in their economies. Thus, the influence of public debt on a country's economic growth cannot be trivialized.

Over the years, excessive borrowing left many governments with large outstanding debts and weak economies, raising serious policy concerns about the suitability of utilizing debt financing to influence economic growth. Empirical findings by León, Murillo and Hernández (2019), revealed that a ratio of 75% between Public Debt and GDP led to a decline in economic growth in Latin America while that of 35% increased volatility in economic growth. A different study carried out by Ogawa, Sterken and Tokutsu (2016) established a causal relationship between the rate of GDP development and public debt to GDP ratio, with the study concluding that, a rise in the real cost of borrowing over the long-term coupled with a decrease in interest sensitive demand leads to a sizeable ratio between debt-to-GDP which has an adverse effect on economic growth in highly indebted countries. However, empirical findings of the same study found no connection between public debt-GDP ratio and GDP growth rate, given any levels of public debt. Yet, available evidence from another study by Yusuf and Said (2018) showed that external debt benefited a country more when prudently utilized for development expenditure since such kind of spending ended up enhancing a country's productive capacity, thus boosting economic growth.

The standard view held is that public debt has the effect of stimulating the level of aggregate demand and economic output in the short-run, but in the long haul decreases output and crowds out private investment (Coulibaly, Brahima, Dhruv Gandhi, 2019). However, the accumulation of public debt by governments in itself is not evidence of an ill-advised policy. This tool of fiscal policy contributes significantly to the performance of an economy both in the interim and steady time periods. While a country's economic growth is dependent on many factors such as improvements in the total factor productivity (TFP), capital accumulation, human resource (labour) formation and global market integration among others, public debt has proven to be a reliable tool of fiscal policy in stimulating of aggregate demand in developing countries.

As the debate continues to attract more contributions from various scholars around the world, policy analyst and economists agree that the debt-growth relationship is country-specific and is based on a number of considerations such as individual country's business cycles, type of economies and country's demographic changes among others. This inquiry sought to ascertain the influence of Kenya's public obligation on its economic advancement from a policy perspective, with empirical evidence of the analysis used to inform policy recommendation on the suitability of using deficit financing to spur economic growth in the country.

STATEMENT OF THE PROBLEM

The influence that public debt casts on economic growth forms an integral part of the macroeconomic environment and its management from the policy front directly affects the macroeconomic stability of an economy (National Treasury and Planning, 2018). Different perspectives in policy have been advanced by various scholars on the desirability of debt financing in augmenting economic growth and otherwise. While some scholars agree that a rise in the utilization of debt financing in the short run due to fiscal expansion helps the economy to grow by stimulating the level of aggregate demand in a country (Chudik et al., 2018), others have observed the presence of a strong inverse connection between debt financing and economic improvements over time (Swamy, 2015) and dismissed public debt as an effective tool of fiscal

policy. Conversely, further evidence casts doubt on the presence of any protracted connection between the two variables with regard to moderate levels of public debt (Saungweme & Odhiambo, 2019). It is the most recent studies that have empirically discounted any drawn out association between debt financing and economic growth in general (Fackry, 2016) that inspired this inquiry. Thus, a clear comprehension of the influence, and the lasting policy implications that the use of debt financing poses on economic growth was of significant interest for this study.

The stock of public debt in Kenya had been increasing in nominal terms over time, incurred largely to support development projects expenditure because of fiscal deficit (National Treasury and Planning, 2018). Its sources included external borrowing from multilateral, bilateral and commercial lenders and domestic loans from issuance of debt securities in the domestic market. Developing country's utilization of deficit financing as an effective tool of fiscal policy to boost economic growth has proved to be an interesting policy subject from the existing body of literature, one that this study sought to contribute to through its findings in the context of Kenya.

Given the fact that many countries all over the world have continued to utilize large amounts of public debt to boost growth in their economies, this study found it crucial to ascertain how Kenya's excessive use of public debt is connected to the achievement of a sustained long run path to economic growth through deficit financing. From a policy perspective, there was little systematic empirical analysis that had been completed on the influence of debt financing on the economic growth in the context of developing economies like Kenya, a gap that the study found apt in filling.

OBJECTIVES OF THE STUDY

i. To ascertain the influence of the size of public debt on nominal GDP.

ii. To ascertain the influence of public debt service costs on nominal GDP.

THEORETICAL REVIEW

This study was underpinned by two theoretical foundations whose contributions to existing literature motivated the discussions behind the empirical findings of this inquiry. Debt Overhang Theory by Myers (1977) points out to a situation where an entity's outstanding debt is so high that it reduces its ability to undertake profitable investments due to its distorted investment incentives downwards, even when the decision to maximize the company's equity value is most viable. . (Diamond & He, 2014). This situation is in part brought about by long-term debts whose maturity period extend for long periods of time, making a firm unable to make investment decisions because of their debt servicing obligations presented by the long-term debts. According to Kobayashi (2015), fiscal deterioration as a result of high debt brings about low growth, ultimately leading to "crowding-out" effects where domestic interest rate rises so high that it hinders investments and causes economic deterioration.

The "Solow growth model" developed by Robert Solow (1956) is a simple and dynamic general equilibrium model that explains how and why output (Y), capital (K), consumption (C) and population (L) change over time (Acemoglu, 2008). Technological progress (A) in the model is assumed to be exogenous and disembodied in the sense that the technology

of production available for the firms in the economy is independent of their actions and raises the productivity of both old and new factor inputs respectively. The model employs Cobb-Douglas production functions with three types of technological progress.

i. Purely Labour-Augmenting technological progress to enhance labour productivity.

$$Y = f(AL, K) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

ii. Purely Capital-Augmenting technological progress to enhance capital accumulation.

$$Y = f(L, AK) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (2)$$

iii. Equally Capital and Labour Augmenting (Hicks-neutral) technological progress to enhance both labour and capital productivity.

$$Y = Af(L, K) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (3)$$

Assuming the Hicks-neutral technological progress, the Cobb-Douglas version of the neoclassical production function used for purposes of this study assumes the functional nature of the form:

$$Y = A.\ K^{\alpha}\ L^{1-\alpha} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (4)$$

Where: α = Share of capital stock in the National Income (Y)

$1-\alpha$ = Share of Labour in the National Income (Y)

EMPIRICAL LITERATURE REVIEW

An empirical analysis from a baseline panel regression by Woo and Kumar (2015) established an inverse and considerable interconnection between deficit financing and economic improvement for both advanced and advancing economies. Regression results from a cross-country Ordinary Least Squares (OLS) estimation showed that, a rise in the primary ratio between Debt and GDP by10 percent on average is connected to a decrease in real per capita GDP growth per year by 0.2 percent with somewhat a smaller effect in the developed economies. An almost similar range of study results by (Chudik et al., 2018) revealed that on average, a consistent 3% annual accumulation in debt-to-GDP ratio is connected with 0.2 to 0.3 percentage points decline in annual GDP growth outcomes. The transmission mechanisms through which debt financing adversely influences economic growth flowed through one or more of the channels identified by some empirical studies, that:

(i) Public debt increases the domestic interest rates by crowding out private investment (Lau, Tan, & Liew, 2019). "Crowding out effect" arises when the rate of domestic interest increases to reduce the spending habit on private investments, thereby reducing the initial increase in total investment spending in the domestic economy (Yule, 2013). The main findings of an empirical study conducted by (Lau et al., 2019) on "The Asymmetric Link between Public Debt and Private Investment in Malaysia" revealed a substantial adverse effect of state borrowing over private credit with a crowding out effect of more than one to one. These findings go along with other findings by (Mahmoudzadeh, Sadeghi, & Sadeghi, 2013) which compared "fiscal spending and crowding out effect between developed and developing

countries".

(ii) Public debt increases the use of fiscal and financial resources through debt servicing costs that would otherwise be reserved for private investment to boost economic growth (Ang, 2009a). The Kenya Economic Survey 2019 indicated that net servicing charges for public debt increased by 48.2 percent in the fiscal year 2017/2018 to reach 664.2 billion in nominal terms (KNBS, 2019). The opportunity cost for these charges is the value of improved transport infrastructure in the country, or enhanced healthcare system that is in deplorable state. "A critical review of the dynamics of government debt servicing in Zimbabwe" undertaken by (Saungweme & Odhiambo, 2018) found out that the service payments of public debt doubled the earnings of improvements in export and GDP between 1980 to 2015, constraining economic performance due to liquidity shortages that further intensified the distress of servicing public debt. These findings highlighted the critical need for policy reforms in the management of public debt servicing costs, geared towards reducing the challenges of increasing debt finance not only in Zimbabwe but also across other countries in Africa.

(iii) Public debt induces uncertainty over the expectation of higher future taxes in future thereby hampering economic growth (IMF, 2015). An inquiry conducted by (Alawneh, 2017) on "The Impact of Public Expenditure and Public Debt on Taxes in Jordan" established a substantial positive correlation between internal and external public debt and taxes at the level of (α 0.05) consistent with economic literature.

The study findings showed that an increase of internal debt by (100%), resulted in a rise in the amount of the government taxes by (0.462794) as the Government worked to increase the tax revenue in order to repay and service its internal debt. Similar empirical studies by (Casalin, Dia, & Hughes Hallett, 2019) reveal that the level of debt an economy holds determines to a very large extent that ability of of a country to raise taxes or institute new ones in order to achieve financial stability which is ensured by an anticipated stream of tax revenues. This is especially critical for developing countries with heavy reliance on debt because their ostensible yield is extremely unpredictable to tax changes due to exchange rates and crude material price instability (Casalin et al., 2019).

Some empirical analysis however, showed a favorable short-run connection between debt financing and economic growth. An empirical inquiry by Afonso and Ibraimo (2020) on "The macroeconomic effects of public debt in Mozambique", applied the use of Vector Auto Regression Models to assess the influence that public obligation has on economic improvement and concluded that external debt financing had a positive influence on real output during the period under review, with ambiguous result on price levels, but no substantial effect on the rate of interest variables in the short run. Over the long haul nontheless, public debt acquired for highly ranked development projects together with well valued and independent programs contribute favourably to the growth of the economy. This was according to long-run Granger Causality results of an empirical study by Esteve & Tamarit (2018) on "Public Debt and Economic Growth in Ghana" which showed a statistically consequential and favorable influence of debt financing on rates of growth of real GDP, suggesting a significant contribution of deficit financing to the growth of Ghananian economy.

CONCEPTUAL FRAMEWORK

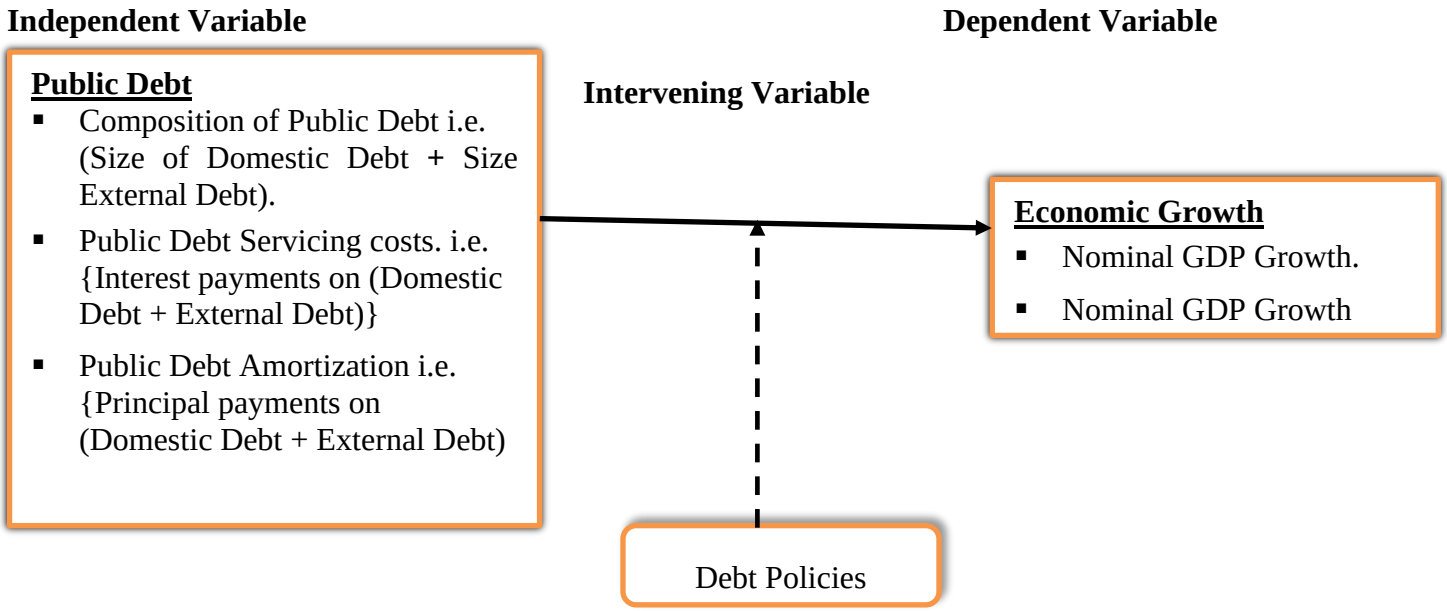


Figure 1: Conceptual Framework

RESEARCH METHODOLOGY

The investigation embraced the utilization of non-experimental, correlational research design in estimating public debt-economic growth relationship so as to appropriately ascertain the influence that public debt had on the growth of Kenyan economy following the Solow-growth model of general equilibrium developed in chapter two. Annual secondary data of time series nature for the period between 1999 and 2019 were sourced from World Bank reports, the Central Bank of Kenya (CBK) publications, KNBS statistical bulletins and The National Treasury reports and empirically analyzed to ascertain the influence of public obligation on Kenya's economic growth. The data frequency (annual) and the time period was selected based the availability of data in authorized sources and after careful considerations of the existing circumstances, public-debt debates intensification, in addition to the paltry analytical research carried out on the impact of debt financing on the growth of Kenyan economy within the study period. The main variables of analysis of Public Debt were; Domestic Debt (DD) and External Debt (ED) Outstanding, Domestic Debt Principal and Interest Payments (DDS) and External Debt Principal and Interest Payments (EDS). Nominal GDP (NGDP) and Nominal GDP Growth Rates (NGDPGR) were used as proxy indicators in the empirical analysis of economic growth.

The regression analysis of the study employed the use of ***Vector Autoregressive Model*** (VAR) in ascertaining the impact that public debt projected on economic growth in Kenya because of its ability to cater for data trends, provide the feedback effects between values both in past and present, as well as in light of the stochastic behavior of data. The model leveraged on the past observed outcomes of economic growth proxies to predict their future expected values in light of the explanatory variables of public debt proxies, a quality that made it most suitable for supporting the empirical findings of the study in formulating policy recommendations.

The presence of unit roots in each study variable in the time series model was tested using "Augmented Dickey-Fuller (ADF)" test in order to establish the existence of non-stationarity in the times series data. ADF test was carried out due to its famous application in estimating model variables for stationarity using time series data. Equation (5) below models the general ADF equation.

$$\Delta Xt = \mu + \gamma T + \delta Xt - 1 + \sum_{i=1}^{k} \lambda i \, \Delta Xi - 1 + \varepsilon \dots\dots\dots\dots\dots (5)$$

Where; Xt represents the variable in question,

T is the trend,

k is the lag length and

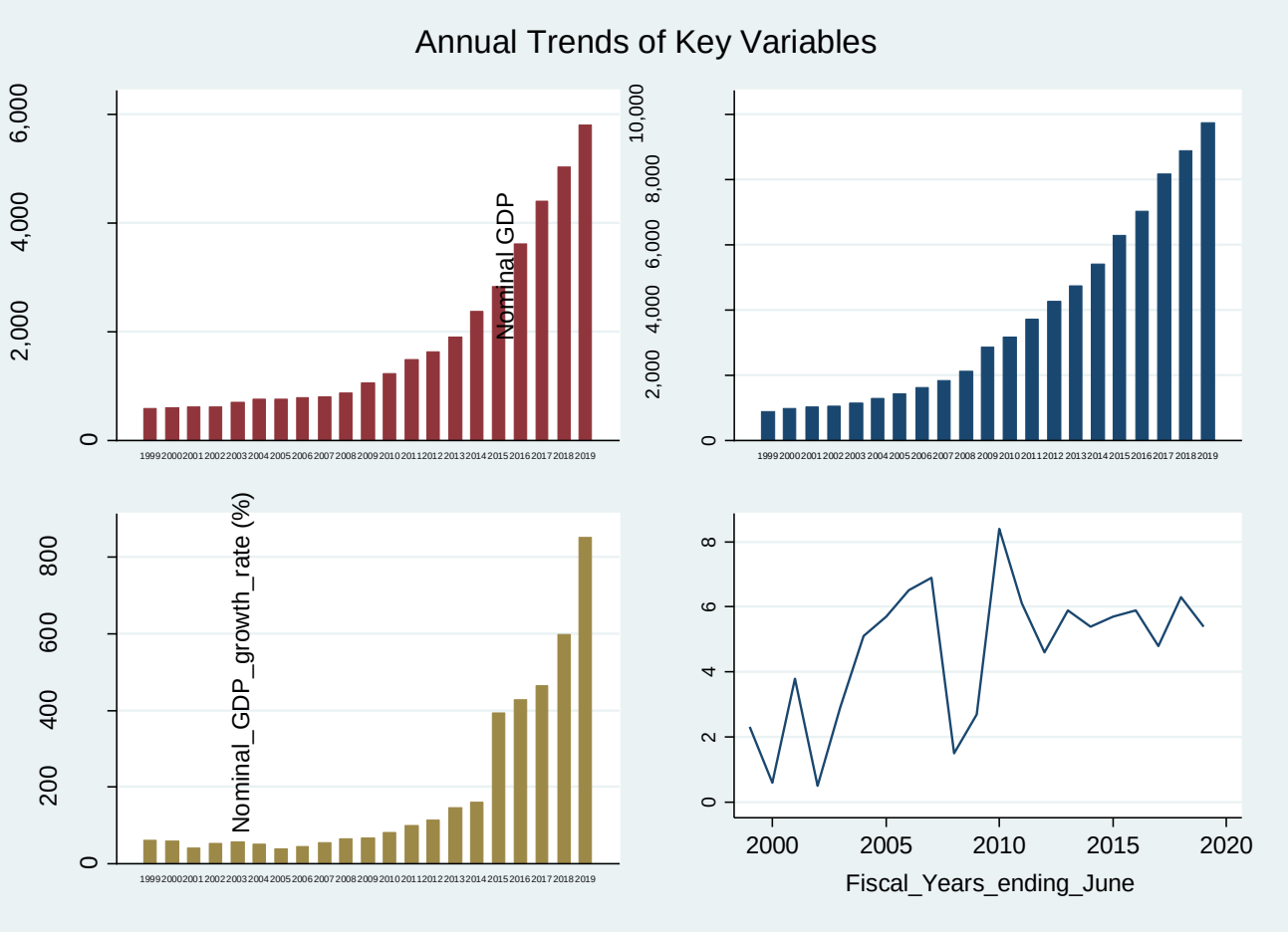
ε_t is a random variable assumed to be white noise.

Johansen's multivariate cointegration test was performed in examining the long run association between the model factors through the assessment of the number of cointegration vectors. Finally, Granger causality estimation technique was executed to affirm the course of causality between public debt and economic improvement in the economy. The technique was important for revealing the proximate and fundamental influence of public debt proxy variables on economic growth in model. All the data were analysed using STATA version 14.

RESEARCH FINDINGS

The results in figure 2 below above showed the annual trends of key variables within the period under study. It was evident that public debt and economic growth were on a steady upward trend over the observable years with the corresponding public debt service and economic growth rate registering the same upward trend. However, the pace of economic growth rate was unsteady over the years as evidenced by the zigzag trend line.

Figure 2: Annual Trends Analysis of Key Variables (Kshs. Billions)



Source: STATA Visualization.

The results of the ADF unit root tests for every one of the factors utilized in the model as tabulated below revealed that the null hypothesis for the presence of unit roots is dismissed at 5% significance level. Therefore, every one of the factors were discovered to be fixed, and the outcomes got from the regression of the factors predictable. This implied that the association between public obligation and economic improvement in the model estimation would not be misleading.

Table 1: ADF Test Estimation Results.

Variable	T - Statistic	5% Critical Value
NGDP	7.173	-3.000
NGDPGR	-3.046	-3.000
PD	10.009	-3.000
PDS	4.004	-3.000

Source: *Author's Computations*

The results of vector autoregression (short-run) estimation between public debt variables (PD and PDS) and economic growth variables (NGDP and NGDPGR) showed that the first lag of public debt on economic growth (PD, L1 = 0.620) is not as significant as compared to its second lag at 10% significance level (PD, L2 = 0.074). The empirical analysis of the VAR was therefore able to conclude with 90% significance level that only the second lag of deficit financing has a causal influence on economic growth in the short-run. However, both lags of public debt service (PDS, L1 = 0.629, L2 = 0.649) were found not to be significant to economic growth, inferring no causal impact on economic growth (NGDP) in the short run.

When it came to economic growth rate (NGDPGR), both lags of public debt (PD, L1=0.759, L2=0.935) and public debt service (PDS, L1=0.508, L=0.612) were found to have no significant causal effect on economic growth rate at 10% significance level. The empirical analysis therefore, concluded that in the short-run, deficit financing and its related service costs had no causal effect on the economic growth rates in Kenya.

Johansen's test for co-integration was performed in examining the long run connection between debt financing and its related service cost variables and economic growth through the estimation of the number of cointegration vectors. The presence of cointegration in the model variables concluded that the time series exhibited a long-run association between public debt and economic growth, implying that the variables are connected and can be consolidated in a direct design. It also implies that, in the event of a shock, the movement of individual variables may be affected in the short-run with no causal impact between public debt and economic growth, but ultimately, there will be a long run convergence in these variables.

Granger Causality (Direction of Causality)

The final step of the empirical analysis involved the estimation of model granger causality to determine which variable between public debt and economic growth caused a movement in the other. The results of the model granger causality are summarized below.

Table 2: Granger causality Wald tests estimation results.

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. vargranger

  Granger causality Wald tests
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Equation	Excluded	F	df	df_r	Prob > F
NGDP	NGDPGR	1.8031	2	10	0.2144
NGDP	PD	4.955	2	10	0.0320
NGDP	PDS	.19624	2	10	0.8249
NGDP	ALL	2.9543	6	10	0.0630
NGDPGR	NGDP	1.3294	2	10	0.3076
NGDPGR	PD	.305	2	10	0.7437
NGDPGR	PDS	.31511	2	10	0.7367
NGDPGR	ALL	1.0391	6	10	0.4551
PD	NGDP	11.015	2	10	0.0030
PD	NGDPGR	1.0218	2	10	0.3947
PD	PDS	13.716	2	10	0.0014
PD	ALL	10.361	6	10	0.0008
PDS	NGDP	4.453	2	10	0.0414
PDS	NGDPGR	.84987	2	10	0.4562
PDS	PD	10.439	2	10	0.0036
PDS	ALL	5.3526	6	10	0.0102

Source: *STATA Results.*

From the results above, the P-value of the null hypothesis that "public debt does not granger cause economic growth" is given by (Prob > F = **0.0320** < 0.05). Null Hypothesis is therefore REJECTED at 10% significance level and conclude that public obligation indeed granger causes economic improvement. However, the P-value of the null hypothesis that "public debt service does not granger cause economic growth" is given by ((Prob > F = **0.8249** > 0.05). Ho: is ACCEPTED with the inference that indeed public debt service does not granger cause economic growth. Taking everything into account, it concluded that the cointegration of NGDPGR, PD and PDS do not granger cause economic growth at (Prob > F = 0.0630> 0.05).

Looking at the null hypothesis that "economic growth does not granger cause public debt", Ho: is REJECTED at 95% confidence level and conclude that indeed economic growth granger causes public debt (Prob > F = 0.0030 < 0.05). This means that the cointegrating causal effect of NGDP and PDS is so significant on public debt that their movements in the long-run have a huge impact on public debt. Summarily, it is concluded with 99% level of confidence that the combination of NGDP and PDS granger caused public debt with a P-value of (Prob > F = 0.0008).

In general, the cointegrating causal effect of NGDP, PD and PDS had no effect on public debt both in the short run and the long run. However, the cointegrating effect of NGDP, NGDPGR and PD had a sizeable causal effect on PDS over the long run.

CONCLUSION

The results of this study concluded that public debt influenced economic growth in Kenya. First, the findings of VAR and Johansen test for cointegration revealed that the impact of public debt on economic growth was significant both in the short run and over the long run. The causal effect of public obligation on economic improvement was also found to be unidirectional, revealing that it was public debt that had an important influence on economic growth and not the other way around. This suggests that the administration of public obligation both in the interim and over the long haul is essential in ensuring that sustainable levels of economic growth are maintained for continuous improvement of economic welfare and development in the country.

The examination also uncovered the existence of a positive and basic association between public debt and economic growth in Kenya. As more debt was being utilized, the economy continued to grow and flourish, lagging behind with it significant growth rates in different sectors of the economy. This implies that for the Kenyan economy to encounter high growth rates, public debt may be used employed to reinforce significant growth in nominal GDP in various sectors of the economy over the long haul. However, this may require a well-informed strategy as increased utilization of public debt to grow the different sectors of the economy conspired a significant increase in public debt service which had an indirect but significant influence on the country's economic growth rates. This could ultimately lead to observed reduced growth rates over the long haul. However, the study did not reveal directly the causal influence of public debt and its related service costs on Kenya's economic growth rates. There was also no evidence of any potential "debt overhang" phenomenon ever occurring in Kenya because of inordinate usage of public debt as the economy unilaterally grew with the ramping up of public debt.

POLICY RECOMMENDATIONS

By and large, Policy makers in the national government ought to consider embracing the accompanying suggestions as an issue of policy strategies in the utilization of debt financing.

Firstly, the utilization of debt financing ought to be viewed as just if the justified use of public debt will result in expanded economic and production activities intended to help various sectors of the economy

Secondly, the National Treasury ought to acquire a greater amount of bilateral and multilateral credits and less of commercial loans in balancing the suitability of using public debt in order to forestall the expanded public debt service costs from watering down the growth rates of various sectors of the economy. Multilateral advances would have the most noteworthy influence impacts since they are given at concessional financing costs. The utilization of such acquired financing is more straightforward and can be followed responsibly to sectoral development in the economy.

Thirdly, Public Debt Management Department of the National Treasury ought to likewise consider focusing the largest portion of acquired debt financing to the most useful sectors of the economy in order to realize adequate returns in term of higher economic payoffs to cover the procured loans.

CONFLICT OF INTEREST

No potential conflict of interest has been recorded by the authors.

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