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INFLUENCE OF INFRASTRUCTURE EXPENDITURE ON GROSS DOMESTIC PRODUCT GROWTH IN KENYA

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Abstract: *Government expenditure is a critical tool which governments usually use to bring about equitable distribution of income and wealth and hence, create stability in prices, manage inflation, create employment and spur growth. Kenya government spends substantial amounts of money annually on physical infrastructure, education, health care, economic services, public order and national security, defense and general administration. Therefore, the issue of which government expenditure can foster permanent movements in economic growth becomes important. The main objective is to determine the influence infrastructure expenditure on gross domestic product growth in Kenya. The study is informed by Solow growth theory. Empirical methods are employed to analyze the influence infrastructure expenditure on gross domestic product growth in the 47 counties of Kenya. The survey and evaluation program frame was adopted, and so was an inductive ex post facto cross sectional quantitative survey design. Secondary panel data were collected from National Treasury. Data for the period 2013-2017 were used to run a multiple regression using EViews software. This study has adopted the basic growth accounting and used a production function model in which the rate of economic growth is a function of labour, capital accumulation and factor productivity. The study further adopted panel data approach to identify the parameters of concern and it covers a period of 5 years. In analyzing data, the study has employed Hausman test which helps to choose fixed effects over random effects. The significance of a regression coefficient is determined by use of the t-test statistic and the significance tests are carried out at 95% confidence level or at the 5% level of significance. The study has established that county government infrastructure expenditure is inversely related to, and important in influencing, economic growth in Kenya.*

Keywords: *Infrastructure Expenditure, Economic Growth*

Introduction

Government expenditure is a critical tool which governments usually use, in cases of market distortions, usually use to bring about equitable distribution of income and wealth and to create stability in prices, manage inflation, create employment and spur growth. Several studies have attempted to investigate the channels through which different types of government expenditure can influence growth. Chingoiro and Mbulawa (2016) undertook a causality analysis between infrastructure expenditure and economic growth, and labor was introduced into the framework as a control variable. The study also undertook to establish if innovations in one variable would influence the future behavior of the other. Annual data used in this study were obtained from World Development Indicators for the period 1980 to 2013. Using Granger causality approach, the study

reveals that: there is bidirectional flow of causality between economic growth and infrastructure. Shocks in economic growth explained the behavior of infrastructure even beyond eight years, and infrastructure expenditure is explained by innovations in the previous period. The findings suggest that the government should commit more funds towards developing infrastructure in the short term. This should be complemented by improving the quality of institutions and the level of regulation to enhance sustainable growth.

Adam (2003) studied external debt, economic growth and poverty eradication in sub-Saharan Africa using a neoclassical production function and co-integration Error-Correction technique in testing the short-run dynamics and long run equilibrium relationships. He used simultaneous equations technique of analysis to capture the complex and the indirect relationships between the variables. The results revealed that GDP had an unexpected significant reverse association with public spending on social goods and services which were not enough to trigger growth in sub-Saharan Africa economies. Hong and Nadler (2015) conducted a study to examine whether political and institutional factors are germane in explaining how the U.S. budgetary variables are impacted on. Among their findings is the fact that a strong democratic environment and focus in the government law making organs is significantly related to increases in the perceived risk of the government. The findings, in addition, reveal that, controlling for a range of economic factors, greater proportion of public sector coalition membership, lack of guaranteed rights to labour laws, and effective collective bargaining powers are strongly related to the rise in the perceived risk of the government and that the right to strike does not have any significant influence on public bond yields.

Hong (2015) investigated the effect of infrastructure budgetary rules on the U.S. budgetary outcome and whether the effects were related to political and economic factors. He also revealed that balanced budget rule is a critical environment for fiscal policy outcome. He further advanced the hypothesis that the effect of budget rules depends significantly on political factors, particularly on the party identity of the head of the executive, that budgetary rules are much more binding when the governor is a Republican, but the identity of the party controlling the government lawmaking organs do not have a significant effect. He further elucidated that the effect of budget rules also depends on whether the state is divided. Budgetary rules are less binding in an undivided state, in which one party controls the executive, and another controls the legislature, while the effect of the rules are greatly unaffected under divided lawmakers, in which different parties control each legislative chamber.

Edame (2014) studied the determinants of public infrastructure spending in Nigeria, using ECM. He also discovered that the rate of urbanization, public revenue, population density, external reserves, and type of government jointly or individually affect public spending on infrastructure in Nigeria. Aregbeyen and Akpan (2013) conducted a study on the long-term determinants of public expenditure in Nigeria, using a microeconomic analysis. In their study, they argue: that foreign aid significantly and positively influences consumption expenditure at the expense of capital expenditure; that revenue is also positively related to public expenditure, that trade openness negatively affects public expenditure; that debt service obligation negatively affects all the categories of public spending in the long run; that the greater the size of the urban population the greater is public consumption spending on economic environments; that Federal government expenditure is biased towards consumption expenditure, which increases significantly during an election period than would otherwise be the case.

Adebayo, *et al.,* (2014) examined the influence of state expenses on industrial growth of Nigeria via co-integration and causality and found that public expenditure on administration, production of services, and redistribution of resources showed a negative equilibrium correlation with growth in industrial sector in Nigeria

while public expenditure on social amenities has a positive equilibrium correlation. Thus, they concluded that there was no crowding-out effect. All these studies reviewed combined economic, social, and political determinants of government expenditure in Nigeria.

Governments are facing difficulties in managing spending, in particular with the devolved units of governance. From time to time, workers represented by their unions have pushed for better wages and salaries, and this has always called for the restructuring of the government budget. This mounting pressure sometimes pushes the government into borrowing but this would only further aggravate the situation as it increases local debt. There have been grave concerns by policymakers that there is the tendency of blossoming government expenditure causing inflation to shoot to soaring levels. Moreover, interest and overall investment in the economy tends to go down due to low saving and higher cost of borrowing (Oketch and Linge, 2018). In light of this, this study seeks to establish the influence of infrastructure expenditure on GDP growth in Kenyan counties using time panel data for the period 2013-2018.

Statement of the Problem

Kenya government, through the county governments, has undertaken various budget rationalization and reforms aimed at curbing unproductive government expenditure, which has been rising over the years. Government expenditure has also been restructured to enhance economic growth by increasing development expenditures, especially those targeting investments in education and health. In Kenya, economic growth has been fluctuating despite the government expenditure increasing over time. From theory, when there is an increase in government expenditure, it is expected that the economy will exhibit a positive economic growth, but this does not seem to happen in the case of the 47 counties in Kenya. However, despite the reforms, economic growth in the counties has not kept pace with government expenditure growth. Therefore, the issue of which government expenditure can foster permanent movements in economic growth becomes important. Therefore, there exists the need to investigate the influence of infrastructure expenditure on gross domestic product growth in Kenya

Objective of the Study

The objective of this study was to determine the influence of infrastructure expenditure on gross domestic product growth in Kenya.

Hypotheses of the Study

Ho_1: There is no significant relationship between infrastructure expenditure and gross domestic product growth in Kenya.

Keynesian Theory

Government spending is justified as it is considered as a platform for creating jobs and employing underutilized capital when an economy undergoes a recession with low levels of employment of labour and capital (Keynes, 1936). The hypothesis is that during economic slumps, an expansionary budget policy is necessary to raise aggregate demand in an economy, thus boosting gross national income. This has the implication that growth in state spending leads to greater employment in public sector and in firms in the business community through the government multiplier process. Keynes continues to observe that when employment of labour and capital continues to rise, output and income of companies also increase, and as a result, businesses hire more labour to produce the goods and services needed by the government. In the event that production process does not go

to full employment as in the case of many developing economies, one noticeable situation is the unemployment uproar in the labour market. At this point the state is expected to exogenously change the production process through its expenditure. In Kenya, there has been outcry of massive unemployment of youths and, in fact, recent statistics show that the scenario was at its highest peak of 11.8 percent in 2016 (Republic of Kenya, 2017). To put the economy in a development trajectory that would ensure maximum employment, government intervention looks quite necessary. Thus, this theory seems more applicable in the Kenyan case in which the wage bill is steadily increasing.

Influence of Infrastructure Expenditure on GDP Growth

The importance of infrastructure development in enhancing economic growth cannot be underestimated. The debate on the connection between economic growth and infrastructure is still far from over. Empirical work that examines the relationship between economic performance and infrastructure investment dates back to 1989, when Aschauer presented his seminal paper on how infrastructure investment impacted factor productivity in the United States (Sahoo and Dash, 2009 and Serven, 2010). The time series results obtained showed that public investments in infrastructure significantly impacts positively on labor productivity. Subsequent researches in this area have employed different data methodologies ranging from reduced-form models of growth, cross country and panel data econometric modeling. A borne of contention in the application of these different methodologies has been comparability of the research findings. Some econometricians have argued against the technicalities surrounding certain methodologies used in some studies including issues of unresolved endogeneity, stationarity of variables, choice of functional forms used in the models, and so on (Estache and Garsous, 2012). However, most of these studies have demonstrated the positive effect of infrastructure on the economy [(Sahin, *et al.,* (2014), Owolabi (2015), Fedderke and Garlick, (2008)]. Calderon and Serven (2008) view the supply of infrastructure services as being necessary for growth. Their study assesses the impact of infrastructure development on inequality and growth using a panel of 100 countries. They show that quality and quantity of infrastructure has a positive and negative impact on growth and income equality in the long term and short term, respectively. Infrastructure helps reduce poverty in the country. This is supported by Ahmed, Abbas and Ahmed (2013) in their study showing that public infrastructure investments positively affect growth and reduce poverty in the long term. Sahoo, *et al.,* (2010) argue that infrastructure stock is not the only key driver of growth but other factors include labor force and investment expenditure. They further show that causality between infrastructure and growth is unidirectional which justify the need to increase expenditure on growth. Infrastructure needs to be supported by human capital formation.

Srinivasu and Rao (2013) suggest that expenditure on infrastructure is vital to achieve development targets in the economy as it provides the platform upon which development initiatives bear fruit. In other words infrastructure is a vital precondition for growth thus it plays an indirect role on growth. Babatunde, *et al.,* (2012) further argues that investment in infrastructure directly affects growth by working through industrial output and indirectly through sectors like manufacturing and oil. Nedozi, Obasanmi and Ighata (2014) suggest that infrastructure is an integral part of growth as it is an intermediate product for the real sector and a finished product from the consumer's point of view. Studies have failed to agree on the direction of causality, Kaurand Malhotra (2014) suggest that there is causal relationship moving from telecommunication development to growth. This finding is later dismissed by Owolabi (2015) who found no causal relationship between the two variables. However, Banerjee, *et al.,* (2012) argue that the proximity to transportation networks has a moderate positive effect on per capita GDP across sectors but it has no effect on per capita GDP growth. A bi-directional causality between the two variables has been observed by other researchers as well in literature (Babatunde, *et*

al., 2012 and Kumo, 2012). The main observation from literature is that there is no agreement on the direction of causality between economic growth and infrastructure, there is no uniformity in the measures used for infrastructure and that studies have used different methodologies. This creates a need to examine the connection between the two variables in the context of Kenya.

Research Design

This study has employed empirical methods to analyze the influence of infrastructure expenditure on gross domestic product growth in Kenya in the last five years, covering 2013 to 2018. The study has adopted the survey and evaluation program frame, and employed an inductive ex post facto cross-sectional survey design. Secondary panel data on County government expenditure covering the 47 counties were used to carry out the analysis. The data were obtained from the Kenya Bureau of Statistics and County government annual financial records for the study period. Data for the period 2013 to 2018 were used to conduct the Hausman Analysis using EViews Software. This is a statistical package for windows, used mainly for time series, econometric analysis. Descriptive statistics were generated to provide results for interpretation.

Theoretical Framework

This study adopted the basic growth accounting and used Solow's (1956) production function model, in which the rate of economic growth is a function of capital, labour accumulation and factor productivity.

$$g_{it} = g\,(L_{it}, K_{it}) \quad \text{.....(1)}$$

Where; g_{it} is GDP growth of County **i** in period **t; g** is a functional notation, L_{it} is labour used in production **i** in period **t** and K_{it} is capital used by **i** in period **t**.

According to Agell, Lindh and Ohlsson (1997), this model assumes that total factor productivity depends on the rate of export, level of investment, capital accumulation and the size of government consumption. Therefore, capital accumulation in equation (1) can be presented as:

$$K_{it} = Ø\,(INF_{it}) \quad \text{.....(2)}$$

In this study, it is postulated that growth of county GDP is influenced by county expenditures on infrastructure (INF). This is to say that economic growth of a county (g) is some function of this expenditure variable.

From equation (3.2), the standard production function of the economy becomes:

$$g_{it} = f\,(INF_{it}) \quad \text{.....(3)}$$

Where:

f - is the notation of a general function, which is assumed to be having continuous first- and second-order partial derivatives with respect to each of the four explanatory variables.

g_{it} - is the dependent variable representing growth rate of gross domestic product (GDP) within County í in period t; í = 1, 2, 3, …, 47 and t = 1, 2, 3, …, 5.

INF_{it} - represents expenditure on infrastructure within County í in period t;

In its specific form, the function may be linear or exponential. If linear, then it takes the following specific form (4):

$$g_{it} = u_i + \alpha_1 gINF_{it} + \varepsilon_i \quad \text{.......................................(4)}$$

Where: α_1 is a parameter of the function, with u_i representing individual heterogeneity and α_1 is the coefficients of the four independent variable to be obtained by estimating the function. ε_i is an error term, which is assumed to be normally distributed with a zero mean.

If exponential, then the function takes the following specific form:

$$g_{it} = \beta_1 INF_{it}^{\beta 2} e_i, \text{.......................................} (5)$$

Where: β_1 is the exponential parameter of the function.

This function is estimated in the following natural logarithm form:

$$\text{In } g_{it} = \text{In}\beta_1 + \beta_2 \text{In } INF_{it} + u_i \text{ ....} (6)$$

Where: u_i is a random error term with zero mean.

Equations 4 and equation 6 are estimated using panel regression technique. Subsequent analyses are based on the results of the function which performed better with the data.

Since (4) and (6) are panel data equations, diagnostics was done using Hausman Test to determine whether fixed effect or random effect model would be estimated.

Growth of county GDP is influenced by county expenditures on; infrastructure (INF). It is believed that expenditure is a critical tool which governments, in cases of market distortions, usually use to bring about equitable distribution of income and wealth and hence, create stability in prices, manage inflation and spur growth.

Specification and Measurement of Variables

Economic Growth

Economic growth is defined as an increase in the production of economic goods and services, compared from one period of time to another. It can be measured in nominal or real terms. In this study it is measured in real terms i.e., it is measured by change in GDP at constant prices as share of GDP.

Infrastructure Expenditure

Infrastructure expenditure in this study includes infrastructural development and maintenance of roads, bridges, highways and buildings. Infrastructural expenditure is measured by cross-examining the amounts allocated and the costs incurred by the respective counties as a ratio of GDP.

Data Types and Sources

This study has adopted a panel data approach to estimate the parameters of concern over a period of 5 years in the process of establishing the influence of infrastructure expenditure on gross domestic product growth in the counties of Kenya. Data were generated in line with the period covered by the study, which is 2013-2018. The data sources for this study are mainly secondary in nature. Data on components of government expenditures, development expenditure (DEP), recurrent expenditure (REC) and national income as proportion of GDP, were obtained from Statistical Abstract and Economic Surveys, which were obtained from Kenya Bureau of Statistics. Data on GDP, infrastructure, education and agriculture were compared with data from World Bank

(2013-2018). The study obtained some data also from Statistical Bulletins of the Central Bank of Kenya (CBK).

Assumptions of the Models

The least- squares dummy variable (LSDV) model allows for heterogeneity among subjects by allowing each entity to have its own value as shown in model (7).

$$C_{it} = \beta_{1i} + \beta_2 Q_{it} + \beta_3 PF_{it} + \beta_4 LF_{it} + u_{it} \quad \ldots\ldots (7)$$

$i = 1, 2 \ldots 6$

$t = 1, 2....47$

According to Gujarat, Porter & Gunasekar (2012), the specific assumptions of the constant coefficients model, as used in this study, are as follows:

The explanatory variables are non-stochastic.

The explanatory variables are strictly exogenous.

The fixed effects (regression) model (FEM) assumes that the (slope) coefficients of the regressors do not vary across individual counties or over time.

Analysis Techniques

The study has employed Hausman test to determine whether it exhibited a fixed effect analysis or a random effect analysis. The fixed effects explore the relationship between predictor and outcome variables within an entity (country, county, person, company, etc.) has its own individual characteristics that may or may not influence the predictor variables, whereas, random effects explore the relationship between predictor and outcome based on outside individual characteristics. The panel least squares model is then estimated with the selected effects of analysis.

Testing of the Hypotheses

Hypothesis testing assessed whether there is evidence to contradict a proposed parametric restriction. The hypothesis to be tested is a Null hypothesis, H_0: θ_0 or $H_{0:}$ r (β) = $\theta_{0.}$ The compliment of the null hypothesis (the collection of parameter values which do not satisfy H_0) is the alternative hypothesis, H_1: $\theta \neq \theta_0$ or 1.

Where; θ = r (β) represents real valued parameters and θ_0 is the hypothesized value.

In hypothesis testing, it is assumed that there is a true (but unknown) value of θ and this value either satisfies H_0 or does not satisfy H_0. The goal of hypothesis testing is to assess whether or not H_0 is true and consistent with the observed data.

Regression coefficients were evaluated by use of t-test statistics and the significance tests are carried out at 95% confidence level or at the 5% level of significance. The statement of hypotheses is:

H_o: $\beta_1=\beta_2=\beta_3= \ldots\beta_k=0$…….. (8)

$H_o=\beta_j=0$ for at least one j. These inferential tests are conducted at 95% level of confidence.

Hypothesis testing is used to give confidence model an assumption that the error term is normal and independently distributed, with a mean of zero and a variance of the Square of the standard deviation.

The null hypothesis underlying the Hausman test is that the FEM and ECM estimators do not differ substantially. The test statistic developed by Hausman has an asymptotic χ^2 distribution. If null hypothesis is rejected, the conclusion is that the ECM is not appropriate because the random effects are probably correlated with one or more regressors.

Study Findings

The study has employed Hausman test which has helped the researcher to choose fixed effects as the best estimator in panel data.

Panel Stationarity

The study has applied stationarity test on the panel data to determine whether the panel stochastic processes are stationary or non-stationary. Stationarity test did not exhibit because the time series components were too small to perform a panel unit root. The study employed the Hausman test which helped the researcher to choose between the fixed effects model and the random effects model in estimation.

Model Selection

Panel data model can either be fixed effects model or random effects model depending on the relationship between the variables. Hausman test was carried out to choose the panel model.

Hausman Test

Hausman test is used to test for the null hypothesis, that, one of the compared models gives consistent and efficient results while the other gives consistent but inefficient results. The alternative hypothesis being that, the first model gives inconsistent results and the second consistent. Hausman test dictates that, if the p-value is less than 0.05, reject the null hypothesis and accept the alternative hypothesis. The alternative hypothesis is thus, there is a significant influence of selected categories of county government expenditure on economic growth in Kenya.

Table 1: Hausman Test

Dependent Variable: GDP

Method: Panel Least Squares

Sample: 2014 2018

Periods included: 5

Cross-sections included: 47

Total panel (balanced) observations: 235

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.615800	3.76E-15	1.49E+15	0.0000
INFRUSTRUCTURE	-9.33E-24	3.31E-24	-2.816409	0.0054

Effects Specification

Cross-section fixed (dummy variables)

Period fixed (dummy variables)

R-squared	1.000000
Adjusted R-squared	1.000000
F-statistic	2.62E+27
Prob (F-statistic)	0.000000

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	353.620935	4	0.0000

** WARNING: estimated cross-section random effects variance is zero.

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var (Diff.)	Prob.
INFRASTRUCTURE	-0.000000	0.000000	0.000000	0.0000

After running a cross-section random effects test comparison, the researcher employed fixed effects estimator as a best linear unbiased estimate due to its consistent significance.

Fixed Effects

Fixed effects are statistical effects in which model parameters are non-random quantities and therefore used when analyzing the impact of variables that vary over time. These effects explore the relationship between predictor and outcome variables within an entity (country, county, person, company, etc.). Each entity has its own individual characteristics that may or may not influence the predictor variables.

Fixed effects have time-invariant characteristics which are unique to the individual and should not be correlated with other individual characteristics. Each entity is different, and therefore, the entity's error term and the constant (which captures individual's characteristics) should not be correlated with others. From Table 1, it was observed that infrastructure (0.0071), agriculture (0.0000), health (0.0000) and education (0.0000) had their p-values less than 5%. In econometrics, when p-value or less than 5%, the variable is termed as an important factor. However, t-statistic must also be considered for conclusions. It was also observed that only two variables were significant after a close look in t-statistic (agriculture and health). Agriculture's t-statistic was 7.568 as well as health's t-statistic of 10.893 making them significant, while infrastructure had a negative t-statistic of -2.724 and education with a t-statistic of -9.874 hence insignificant.

The following equations were derived from the Table 2.

Estimation Command:

LS (CX=F, PER=F) GDP C INFRASTRUCTURE……...(9)

Estimation Equation:

GDP = C (1) + C (2)*INFRASTRUCTURE + [CX=F, PER=F]……. (4.2)

Substituted Coefficients:

GDP = 5.6158 - 9.32586503278e-24*INFRASTRUCTURE + [CX=F, PER=F]……. (10)

GDP=5.6158 - 9.3258e-24*INF + [CX=F, PER=F]

Influence of Infrastructure Expenditure on Economic Growth

The first objective of this study was to determine the influence of infrastructure expenditure on gross domestic product growth in Kenya. The study was expected to establish whether there was a short run or long run relationship between county government expenditures on infrastructure and gross domestic growth. The Null hypothesis H_o: is rejected since $P < 0.05$. This study shows that there exists a negative relationship between expenditure on infrastructure and GDP growth. This implies that increasing expenditure on infrastructure may not necessarily translate into increasing productivity across all the 47 Counties. This finding contrast with those of Chingoiro & Mbulawa (2016) who used data obtained from the World Bank (2014) with Granger Causality approach to investigate the direction of causality between economic growth and infrastructure development. The approach held that the time series in the infrastructure variable Granger caused a corresponding time series

in economic growth as measured by the annual GDP growth rates. The study found out that, increase of one standard deviation shock to county expenditure allocation to infrastructure on GDP growth is felt immediately and it is felt it is a positive one. This positive relationship between county expenditure in infrastructure and economic growth which does not fizzle out even in the fortieth year is supported by (Maingi, 2010; Were, 2001; Jerono, 2009). This is so because a robust infrastructure reduces the cost of doing business by lowering the amount spent on vehicle repairs, it also saves on manpower time and fuel lost in traffic jam snail ups and unwarranted delays.

Since infrastructure is a shared function between the national government and the county governments, the result shows that county government's increasing expenditure on infrastructure has a negative impact on GDP growth. This arises from the fact that some county government's decisions on investing on infrastructure in rural access roads development and water supply is purely for the purpose of addressing historical injustices and that would be purely for improving mobility of people and accessibility of water supply. The increasing expenditure on infrastructure is meant to open up closed regions so that the rural population can be able to access social services such as healthcare services, schools and churches. These findings are in line with those of Gachunga & Kuso (2018) who used dynamic panel regression (DPR) to contrast the impact of foreign debt to low and middle income countries. However, the study did not use fixed effects (regression) model (FEM) which assumes that the (slope) coefficients of the regressors do not vary across individual observations or over time. The study did not also use the least- squares dummy variable (LSDV) model that allows for heterogeneity among subjects.

In some counties, increasing expenditure on infrastructure may make economic sense because of the production activities going on in those counties throughout the year, while in other counties infrastructure expansion is not based on economic considerations because there are cases where roads are developed even when there is no meaningful production taking place. Investment decisions on these infrastructure facilities are mostly based on accessibility and as such, their economic feasibility is not of value. Most decisions on improvement of infrastructure are sometimes based more on political considerations than on their economic value. No feasibility studies are carried out to determine their economic feasibility, meaning increased expenditure on infrastructure may impact economic growth differently in the 47 counties. This is simply because counties have their own individual heterogeneous characteristics. In some cases, benefits from infrastructure development may require a longer period for counties to reap the intended benefits. These findings contrast those of Uzoma-Nwosu (2019) who adopted the normal Granger causality method without the error correction term where the variables are stationary to conclude that there is no co-integration between the variables in the equation. The stationarity properties of the variables were determined using the Augmented Dickey-Fuller (ADF) and the Phillips-Perron (PP) tests. However, the positive effect could be as a result of increase in aggregate demand through the multiplier effect. The negative effect (-9.3258 e-24) could have resulted from the crowding out effect due to a fall in disposable income of the inhabitants of the counties. Financing county government expenditure is done through taxes or by borrowing. Hence, increased taxes lower disposable income for the inhabitants of counties and private consumption may fall accordingly. County government expenditure could also have a crowding-out effect on private sector by causing positive effect on interest rates, which in turn could decrease private investment.

Conclusion

On the basis of the results, the study concludes that expenditure on infrastructure has a negative influence on economic growth in the short run. The county government also plays a leading role in determining the pattern

of economic growth through public expenditure reforms, which determine directly how much of an economy's resources to divert to its own use and how those resources should be allocated in order to increase economic growth. The results reveal that county government expenditure reform on infrastructure should be given priority for a government interested in promoting long-run growth. The study concluded that county government expenditure on infrastructure is an important factor in influencing economic growth, with a negative impact. An increase on infrastructure expenditure leads to a fall on economic growth.

Recommendations

Based on the findings, this study recommends that county governments should do proper evaluation on type of investments to make in developing the necessary infrastructure that could help stimulate growth and lead to improved productivity in their respective areas.

The following policy implication can be drawn from the research findings that: the county governments should also allocate more resources to areas of infrastructure in order to stimulate economic growth as envisaged in the vision 2030 as well as the SDGs. This is because additional expenditure contributes significantly to the economic growth by increasing the marginal productivity of inputs in the public sector.

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