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Public Expenditure and Economic Growth in South Africa: Long Run and Causality Approach

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Authors' contributions

This work was carried out in collaboration between all authors. Author OSI designed the study, wrote the protocol, wrote the first draft of the manuscript and reviewed both theoretical and empirical literature including the econometric analysis. Authors UCC and CBC edited the final manuscript while author ICO supervised the research process. All authors read and approved the final manuscript.

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ABSTRACT

This study examined the long run and causal relationship between public expenditure and economic growth in South Africa from 1980 to 2014. The authors employed co integration test, vector error correction mechanism and Granger causality test in estimation of the variables specified in the regression model. The results from the estimations indicated a stable long run relationship between the dependent and independent variables, a negative insignificant relationship between total government expenditure and economic growth, a positive significant relationship between economic growth and total revenue, and significant positive relationship between inflation and economic growth. The pair wise Granger causality showed a one way causality running from national income (RGDP) to total government expenditure in confirmation of the application of Wagner's theory in the economy. In view of the above results the study concludes that a stable long run relationship exists between public expenditure and economic growth in South Africa within the period of the study and that the growth in national income leads to increase in government expenditure as implied by

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Wagner's hypothesis in South Africa. The study consequently recommends a conscious strategy by the South Africa fiscal authorities aimed at increasing the growth of the economy by increasing internally generated revenue.

Keywords: Public expenditure; economic growth; co integration; causality; South Africa.

1. INTRODUCTION

Public expenditure relate to the operating cost made by the government for its upkeep and for the maintenance of the general public in terms of provision of essential services. Public expenditure has been recognized to have association with economic growth and development thus this study is deemed appropriate for policy. The composition of public spending in developing economies has not been steady over some years. It is often established that there is need to appraise the relative trend in public spending across emerging economies and to assess the possible input of each sector to economic growth as this will boost allocative efficiency. For government expenditure to be able to promote growth and development in any economy there is need for the budgeting process to be significantly evaluated to ensure that resources are allocated based on social, human and infrastructural need in the economy.

The World Bank categorized South Africa as an upper middle income nation along Croatia, Mexico, Brazil, Malaxia and Argentina in terms of gross national product per capita. The level of South African economy is by far bigger than the rest of other South Africa development community and she still remains their major trading partner. The country has a population of 54.0 million people, a GDP (PPP) of \$704.5 billion, 1.5% and 2.4% compound annual growth rate, \$13.046 per capita, unemployment rate of 25.1% and foreign direct inflow of \$5.7 billion. South Africa is African's second largest economy after Nigeria and one of the world's largest producers and exporters of gold and platinum, though the 2014 strikes brought platinum mining to a halt. Mining services, manufacturing and agriculture competes with similar sectors in the developed world. Yet many South African's are poor, rates of formal sector unemployment and crime are high and the quality of public education is low. Access to infrastructure and basic services is lacking. Allegations of corruption among civil servants persist at all levels despite an excellent anti – corruption regulatory framework. The process for tendering public contract is often politically driven and dense.

[1] suggested in their study of three developing African countries that government expenditure can be used for advancement of growth in developing economies by the multiplier effect of deficit financing. [2] tested the validity of Wagner's law in South Africa and opines that public expenditure is essential in realizing growth in the economy. He believes that the rise in public spending in South Africa in recent time must not be unconnected to the increasing demand for social services by the black population since the nation's attainment of democracy.

Fiscal theory suggests that public spending can be used to solve economic growth problem in South African economy. The Keynesian and neoclassical economists assume that public expenditure is the valuable tool for government to adopt in tackling the problem of growth in an economy. South African government through public expenditure outlays always center its intention of realizing fundamental macroeconomic target in the areas of economic growth, full employment, price stability and poverty reduction [3].

Public expenditure is payments on material goods including spending on valuable and material properties that can enhance service delivery. [4] states that public expenditure habitually focused on public goods such as provision of health facilities, acquisition of fresh information technology equipments and constructing standardized networks of roads, bridges, flyovers as part of set targets. [5] affirms that government expenditure is the money spent on goods that are classified as investment goods, that is, expenditure with durability features which have ability to raise domestic investment. This consists of infrastructural provisions in health and education sector of the economy, power sector, telecommunication, agriculture, and road construction. The growing unemployment rate in South Africa has been a major concern, in spite of the fact that the government had initiated some programmes aimed at improving national output by a systematic boost in public expenditure.

In 2014, South Africa's development revolved around two percent growth rate of gross domestic product, the worst from the time of the worldwide economic meltdown. South Africa suffered exceptional labour crises since realization of democratic governance, a development that impacted negatively on economic growth of the economy as this was accompanied by decline in her export trade and a decrease in her domestic investment.

In South Africa, the end of foreign rule and introduction of democratic governance in the 1990s led to the rise in the expenditure of government in the effort of Dr Nelson Mandela led administration to speed up social service delivery for the black population after many years of deprivation and neglect. It is useful to note that this desire for social and infrastructural transformation of South Africa is assumed to be responsible for the continued increase in public expenditure in the economy in the recent time. The South Africa government has made numerous efforts to reduce the infrastructural gap particularly within the areas mostly occupied by the black population. The increasing unemployment rate in South Africa with constant civil disturbances and soaring crime rate has also increased public spending in the area of security and provision of social and infrastructural services.

Economists are divided on real effect of public expenditure on national productivity in developed and developing economies. Empirical works by [6,7,1,8,9], among others are not in harmony on the subject matter. The principal view among scholars as well as public policy makers is that government can contribute considerably in improving the level of economic growth via fiscal policy as a necessary tool to reduce poverty and inequality in the economy and realize full employment among other macro economic agenda which is in line with the Keynesian economic ideology.

Despite increasing public spending on agricultural, health, road construction, power, telecommunication and transportation sectors, the significant issue remains whether public spending translates to the improvement of the lives of the ordinary citizen in South Africa? And how far does public expenditure affect national output in South Africa? Economists are also divided along the ideological lines of Wagner's hypothesis and Keynesian theory and the contention has remained whether public

expenditure contribute to growth or hinder economic growth. There is limited combined research on the expenditure and economic growth connection and the outcome of this few empirical research are conflicting, more so the trends of public expenditure and economic growth in South Africa is not consistent with economic theory just as incidence of poverty in the country does not reflect the consistent rise in public spending.

It is evident, that theoretical postulations sometimes conflict with economic realities in the country. Taking the case of the Wagner's law; there are instances where the value of public expenditure increased but accompanied by a negative economic growth. For instance, from 1990 to 1992, growth rate of GDP were, -0.3%, -0.1% and -2.1% respectively, while public expenditure growth rate were 6.9 percent, 2.4 percent and 2.8 percent for the same period. These evidences imply that the behaviour of public expenditure at times follow a conflicting trend with national output.

Expanding public costs has not resulted to consequential progress in the economy. According to the Global Finance Magazine 2013 ranking of the poorest countries of the world based on gross domestic product, at purchasing power parity per capita 2009-2013, South Africa came 45 among 184 countries ranked by the Magazine. Gross Domestic Product (GDP) Purchasing Power Parity (PPP) compares common differences in living standards on the whole between nations because Purchasing Power Parity (PPP) takes into consideration the associated cost of living and the inflation rates of countries, rather than using just exchange rates, which may alter the real differences in income. Also, Worldlistmania.com in ranking of top 20 richest countries in Africa in 2013 placed South Africa 5th even though the country is rated the biggest economy in Africa after Nigeria.

At South Africa, the effect of the global economic meltdown was more pronounced among the poor who live below the food poverty baseline as this number increased significantly between 2006 and 2008 before declining in 2011 to 20 percent from previous higher rates resulting in a general reduction in poverty rate. These soaring levels of inequality, amid the peak globally, are merely to a few extents lesser than the Gini's recorded in 2006. The split of state expenses involving the affluence and poorest continues tenaciously dormant. The affluent 20 percent of the populace

explains over 61 percent of utilization in 2011 (declining from a lofty 64 percent in 2006). Meanwhile, the base 20 percent have their split dwindling from 4.4 percent in 2006 to 4.3 percent in 2011 [10]. The inability of government expenditure to impact positively on national output and development in the economy under study without doubt, calls for critical investigation. Perhaps, the low level of economic growth in South Africa may be attributed to lack of proper implementation of public expenditure programmes over the years. Maybe, reducing economic growth can have significant negative socio-economic consequences in the country.

The trend below (Fig. 1) indicates that as gross domestic product rises public expenditure also increases for a larger part of the study period following the predictions of Wagner's hypothesis that as national income increases, the share of public expenditure in national income also rises (Wagner, 1863). This study shall investigate the relationship between public expenditure and economic growth in South Africa from 1980-2014.

1.1 Analysis of South Africa Public Expenditure

Within the period under review 1980-2014, government of South Africa adopted considerable fiscal control, as shown in an average nominal annual speed of growth in general public outlay of 10 percent. For three financial years prior to 1993/94 for example, the rate of growth in national public spending averaged 17.2% annually. This development in the growth of national public expenditure was

partly due to the lower average rate of inflation that had been recorded in the past two fiscal years. Large special transfers were made in fiscal 1993/94 for shortfalls on public retirees' money and GFECRA account held with the national bank of the country while in fiscal 1994/95 substantial increase in costs were incurred associated with the nation's constitutional transition programme.

Public expenditure totaled R122 billion in fiscal 1993/94, which was only R4.6 billion bigger than the original approximation. Nonetheless, the little rate of increase in general public spending could partially be ascribed to the addition of drought-related aid costs in the records of the previous year, which were not repeated in fiscal 1993/94, owing to the subsequent favourable weather conditions. Proposed and real general public expenditure R billions Per cent H-PF02 1993/94 95/96 Fiscal years 97/98 99/2000 01/02 03/04 05/06 07/08 09/10 11/12 0 100 200 300 400 500 600 700 800 900 1 000 20 22 24 26 28 30 32 . Definite proposed expenditure as a proportion of national output indicates sliding phases of the business cycle and included in total general public expenditure for fiscal 1994/95 was a total of R2.5 billion that had been billed to the RDP. Roughly part of the above sum was used up in feeding programmes in the school system funding of health sector budgets in the country. Total public expenditure was R177 billion by 1996/97, 14 percent above fiscal 1995/96. The rise in expenditure was driven by higher interest payments, employee remuneration, substantial increases in police spending and transfers to provinces within the period under consideration.

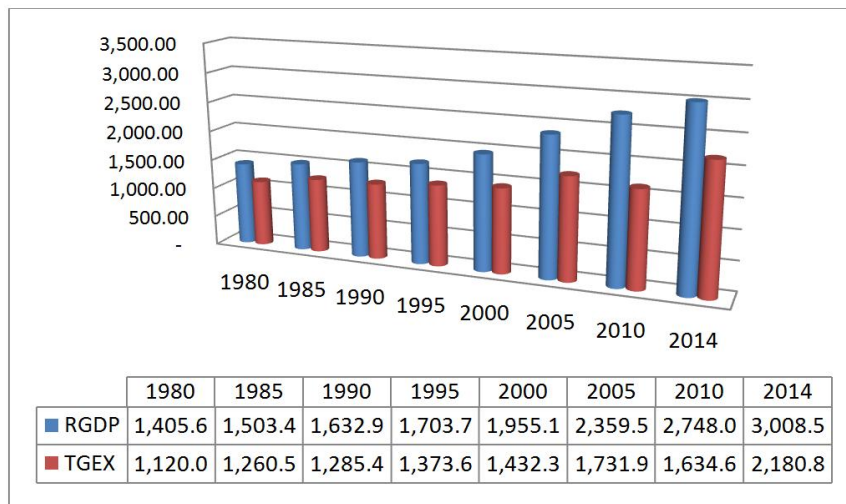


Fig. 1. Interval trend analysis of Public expenditure and National income in South Africa

The growth in overall spending in fiscal 1997/98 was partly the outcome of the rise of 7.0 per cent in current expenditure when compared with fiscal 1996/97. Spending on goods and services (together with salaries and wages) grew moderately in fiscal 1997/98.

In fiscal 1998/99 general public spending was R204 billion or 7.6% more than in fiscal 1997/98. The controlled pace of growth in total spending was a notable attainment in view of the passive feat of the home economy during the previous fiscal year in the economy.

Spending targets benefited from resources gotten from the civil service pension funds in fiscal 1998/99. The employer contributions to the government employee's pension fund were originally paid at a rate of 17% instead of 15% accepted by the employers and employee unions. National revenue fund was paid back the sum of R1.2 billion, being the disparity between the two rates. General public spending was R216 billion in fiscal 1999/2000, fairly bigger than in fiscal 1998/99 while other expenditure involved a few capital outflows as a further transfer to provincial governments which was created as a non-profit business and came into existence in March 2000. Included in general public spending in fiscal 1999/2000 was the sum of R2.0 billion for the purpose of revaluation of foreign bonds and loans that were due. Government supported general control in salary increase through modest wage settlements in the country.

Employee's costs as a percentage of total non-interest expenditure dropped significantly from twenty seven percent in fiscal 1993/94 to 15.9 per cent in fiscal 1998/99 and more to 15.4 per cent in fiscal 1999/2000. Incorporated in general public spending for fiscal 2000/01 were capital outlays being operating cost for rehabilitation purposes, local government administration and elections. A number of additional employee's costs amounting to roughly R1.0 billion were also incurred by government in fiscal 2000/01, due to the new arrangement for the payment of bonuses to public servants. General public spending was R263 billion in fiscal 2001/02 on an annual rate of increase of 12.4% over the initial budget estimate of 10.4%. The percentage increase in expenditure also grew above the annual average rate of growth of 8.5% in the previous five fiscal years in the economy. Comparatively strong growth in general public spending in fiscal 2001/02 became an indication to the change in

the fiscal policy posture of the government, from stressing on consolidation to a more growth-oriented approach of economic management.

Expenditure and loan by the national government was R292 billion in fiscal 2002/03, and recorded an annual rate of growth, which was above initial budget proposal. Comparatively strong growth in general public spending indicated a change in the public expenditure management position moving away from emphasis on cost reduction to emphasis on growth in the economy, placing higher premium on human capital development, funding of education, health and infrastructural provision. Purposely, yearly percentage increase in general public spending was 12.8% in fiscal 2003/04.

Monetary transfers to provincial governments were R185 billion in fiscal 2004/05, which was 17.7% greater than a year previously. General government cash expenditure for operating activities R billions H-PF03 1993/94 95/96 Fiscal years 97/98 99/2000 01/02 03/04 05/06 07/08 09/10 11/12 0 100 200 300 400 500 600 700 800 900 1 000 grants interest plus other payments Supplementary funds were also set aside for general infrastructure development and provision of social services coupled with cost associated with the hosting of 2010 world cup.. In 2006/07 general public spending came in a little below the initially budgeted estimate and resulted to R470 billion.

The slightly lower-than- projected spending result was principally as a result of reserves on debt service costs and minor under-spending by general government ministries.

The spending effect for fiscal 2010/11 indicated that general government was able to deliver on its commitments without having to raise spending. Even though government remained within its spending envelope, it remained a concern that under-spending continued to occur in some priority programmes. Contemporary payments by the justice and protection services cluster also increased significantly during fiscal 2010/11, largely in the form of high compensation of the workforce. Government in the preceding fiscal year prioritized development in the value of education, improved competence in the public service and support for impoverished populace. Transfers and subsidies grew significantly annually in fiscal 2011/12, and contributed more

than two-thirds towards overall budgeted expenditure.

Finally expenditure outcomes for fiscal 2011/14 showed that general government limited its spending within budgeted expectations, but still remained supportive of the expansionary fiscal policy posture [11].

2. THEORETICAL LITERATURE

2.1 The Concept of Fiscal Policy

Fiscal policy is an indispensable tool for stabilization in the economy. This refers to government actions in respect to its income and disbursement as induced by the government net receipts, surplus or deficit. Fiscal policy entails the use of government expenditure and revenue programme to produce desirable effects on the national income, production and employment. The core target of fiscal policy is long run stabilization of the economy which is usually realized by moderating short run economic fluctuations. Hence, fiscal policy through changes in the expenditure and taxation programmes of government has obvious effects on national income. An increase in government expenditure during recession increases the total demand for goods and services and leads to a huge increase in income through the multiplier effect while an increase in taxes decreases the disposable income and consequently reduces consumption and investment spending, hence the government can by manipulating public expenditure and taxation control both inflationary and deflationary trends. Government expenditure financed through deficit budgeting can crowd out private investment in the economy there by having adverse effect on economic growth.

An increase in government expenditure increase total demand, national income and interest rate thereby causing private investment to decline. The argument is based on short and long run effects of expenditure increase on the economy. In fiscal policy management, the application of rules and discretion has remained a major source of controversy. The issue is whether the monetary and fiscal authorities should conduct policies based on a known rule which specifies how policy variables will be determined in prospective economic situations or whether the authorities should apply discretion in determining policy variables as they arise. Public expenditure is used as a stabilization policy in the economy which implies leaning against the prevailing

economic winds. It demands conscious changes in government spending pattern and deficit financing measures during economic booms or recessions as fiscal policy plays dynamic roles in developing economies like Nigeria and South Africa. Precisely, the application of fiscal policy tools especially the use of government expenditure has been useful in addressing various economic problems that has confronted Nigeria in recent times. Since the abolition of apartheid and the entrenchment of democratic institution in South African, fiscal policy has been a major instrument of economic stabilization and growth enhancement.

2.2 Concept of Fiscal Illusion

Fiscal illusion is a concept of government expenditure that suggests that when revenue sources are not transparently disclosed, the cost of governance is perceived to be less expensive than it actually is. The benefit that comes from these unknown government revenue sources increases the public desire for more government spending, hence instigating the political class to expand the size of government. [12] suggest that complicated tax system tend to support fiscal illusion and consequently increases the scope of government spending that it would have been if every tax payer understands fully how much they contribute through the tax system to sustain the cost of governance. Some economists also believe that deficit spending with pretentious tax cuts are unrealistic as they believe that there is a significant negative correlation between the level of government expenditure and tax revenues.

Reduction in tax rate and adjustment in tax structure while sustaining deficit financing makes government spending appear cheaper than it actually is. The concept of fiscal illusion presupposes that the actual cost and benefit of government may be misunderstood by the populace depending on how the fiscal policy tools are administered. Some economists believe that the way and manner government revenue are raised influences the perception of tax payers hence direct taxation causes less fiscal illusion than indirect taxes. Since direct taxes imposes more burdens on the tax payers and will cause them to resist further government costs resulting in an increase in taxation. Indirect tax does not impose much burden on the tax payer hence its contribution to government spending is difficult to measure hence government benefits may be applauded without understanding the actual source of funding.

The bedrock of this theory is that the tax system or structure makes the actual cost of governance to be underestimated with tax payers not truly informed of the actual cost of taxation and its relative contribution in government total expenditure. It is necessary to note that the extent of the operation of fiscal illusion in Nigeria and South African can only be determined empirically. This is true especially in Nigeria where the impact of the proceeds from crude oil is seen as the determinant of government spending and not really based on proceeds from taxes.

2.3 Theory of Allocative Efficiency in Public Expenditure

The Keynesian theory of public expenditure presupposes that public expenditure as a fiscal policy is an instrument to generate demand for goods and services in the economy during deficit financing. This is made possible through the budget process which involves the sharing of the government resources into sectors of the economy based exclusively on the subjective opinion of the government in power who allocates the resources to preferred sectors and withholds it from other sectors not based on any established rules or scientific methodology. The success of every administration and her ability to effectively provide social and infrastructural services for the populace depends on this unscientific discretionary resource allocation style. A major role of contemporary public expenditure management is to develop institutional settings that can guarantee allocative efficiency in public spending. In specific terms, allocative efficiency means the ability of public expenditure authorities to share government resources on the grounds of objective public programs in attaining set development goals. This involves the ability to move state resources from unattractive sectors to choice sectors of the economy, setting her priorities and goals very clearly and mobilizing resources to ensure such goals are met. To be seen to have allocated efficiently, the public expenditure management authorities must be calculative and instructive, looking ahead to define the actual result that is intended to be achieved and subsequently coming back to reexamine the outcome to ensure the set goals has either been achieved or not. Here a link must be established between strategic planning and evaluation in public expenditure management and budget procedures. It is instructive to note that allocative

efficiency cannot be attained under the current incremental budgeting system in South Africa.

Incremental budgeting matched the times but it is an unacceptable way of allocating resources. It promotes wastefulness and has the propensity to bloat the volume of the public sector. Incremental budget does not support fiscal discipline by supposing that spending will grow per annum and thereby increasing the totals as such budgeting principle calls to question due process assumption in public finance. Consequently, recent developments in the field of public finance tend to favour planning-programming-budgeting systems (PPBS) and Zero based budgeting (ZBB) instead of incremental budgeting. PPBS give budgeting a longer time period to grow its investigative competence while zero based budgeting seeks to redistribute resources within the context of initial programs and expenditure. Even though the duo are procedurally different, both PPBS and ZBB seek to intensify competition for budget resources while PPBS provides information on the cost effectiveness of alternative means of realizing government goals, ZBB strives to have every spending unit prepare alternative budgets each with incremental resources and output. It is the opinion of this study that if the objective of public expenditure programmes is to be realized in the developing economies (South Africa in this instance), and allocative efficiency attained with increase in economic growth, then Zero based budgeting must be embraced as against the practice of incremental budgeting.

2.4 Adolph Wagner's Law of Public Expenditure

A German economist, Adolph Wagner over one hundred years ago proposed a theory which implies that as the functions of the state increases in terms of the desire to provide social services, create employment for the populace, increase level of domestic investment, develop human capital and defend her territories against external aggressors, the expenditure pattern of the state will as a matter of reality reflect this expanding activity. Wagner posited that there is an obvious tendency for the volume of public spending to change alongside greater levels of national output and productivity. According to [13] it is important to appreciate the views of Wagner considering that before his revolutionary proposition the general belief is that as an economy grows richer, government programs

and by implication government expenditure has the tendency to grow lesser. This study observes that despite the revolutionary opinion of Wagner on contemporary economic thought, the traditional view is still been held by some conservative economists who doubts the actual applicability of Wagner's law of expanding state activity. [7] suggest that the Keynesian ideology of expansion of government activity is an obvious deviation.

[14] argues that since the emergence of Wagner's theory of public spending several empirical examinations has been carried out to validate the law notwithstanding the controversy over the appropriate modeling and how best to interpret the results. The choice of time series models and cross section models to test the law has also constituted a concern, in addition to the issue of applicability of the theory to emerging economies. [14] further argues that the issue of public spending is an intricate social system that is hard to be understood only by the field of economics. He believes that beyond economic consideration, political reasons, ethical calculations, security and international pressures influence the size and scope of public expenditure. [15] contend that Wagner's law is concerned about the pattern of public spending and not really a theory of public expenditure. [16] revealed hat as per capita income increased in advanced economies, the relative public sector tends to grow in importance.

Wagner gave reasons behind his theory. According to him, as an economy grows in scope and complexity, there will be an obvious institutional change to cope with the emerging legal, commercial and communication issues emanating from division of labour due to the advancement of the industrial sector. Rural to urban immigration increases the population of the urban cities with the attendant increase in

social infrastructural gaps in the city. Water and electricity supply immediately commence under pressure due to population density and crime rate rises, hence compelling the government to raise levels of spending in order to cope with the new challenge.

[17] believes that as an economy advances, the rate of market failure will compel the government to develop matching legal framework in other to cope with the emerging trends; this obviously will result to higher public expenditure. Consequently, Wagner also assumed an increase in cultural and welfare expenditure on the ground that as income rises, there will be a corresponding demand for better and improved education, improved health service delivery, better condition of service for the workforce and improvement in road construction. Wagner predicted that industrialization in the economy will lead to the emergence of a dominant private sector with domineering monopoly influence, whose negative influence on the populace can only be contained by government involvement so as to guarantee economic efficiency which invariably will create additional cost for the government thereby increasing the size of government budget. [17] is of the opinion that Wagner was influenced by events around him at the time of formulating this law in Germany, a time known for rising influence of the German empire and a growth in income due to industrialization. This study therefore concludes that as nations develop and industrialize, their production capacity improves and the economy tend to become efficient in the production and distribution of goods and services which naturally requires competent management implying that the dimension of government spending changes as the demand placed on government services rises. [16] aligns with this ideology that the activities of the state is a growing function of the changing structure of the economy.

There are in broad terms six diverse formulas of Wagner's theory, viz;

- | | |
|--|---------------------------------------|
| i. Peacock and Wiseman traditional version | $G = f(\text{GDP})$ (1) |
| ii. Pryor version | $C = f(\text{GDP})$ (2) |
| iii. Goff man version | $G = f(\text{GDP}/N)$ (3) |
| iv. Musgrave version | $G/\text{GDP} = f(\text{GDPR}/N)$ (4) |
| v. Gupta and Michas version | $GIN = f(\text{GDP}/N)$ (5) |
| vi. Peacock-Wiseman "share" version | $G/\text{GDP} = f(\text{GDP})$ (6) |

Where G is nominal total government expenditure, GDP is nominal Gross Domestic Product, $GDPR$ is real Gross Domestic Product, N is the total population size, and C is government consumption expenditure. This study adopted the traditional version of Peacock and Wiseman in the model specification and estimation.

Wagner's hypothesis is difficult to be tested empirically; however, economists have adopted appreciable measures of national output and public expenditure using statistical methodology to estimate variables of government spending.

2.5 Critical-Limit Hypothesis

Colin Clark formulated the Critical-limit hypothesis associated with the extent the citizens can bear a sustained rise in the rate of taxation presumably introduced to fund war expenditure, since in most of the economies examined, it was discovered that as soon as the people get used to the tax rate after the war it becomes difficult to revert to the earlier tax rate. Colin believes that when the public sector taxation and other revenue exceed 25 per cent of total economic programs, prices of goods and services in the economy rises. He believes that when the amount paid as tax takes a chunk of the additional income of the people, with attendant decline in productivity and a resultant loss of supposed incentives, the people tend to oppose less government deficit financing methods.

As the total demand rises as a result of inflationary financing policies, total supply declines as a result of loss of incentives and, subsequently inflation results in the economy.

3. EMPIRICAL REVIEW

[7] reassessed the applicability of Wagner's hypothesis in the economy of South Africa spanning across 1950-2007 making use of co integration and granger causality econometric tools of analysis. The result of the econometrics estimation by the authors shows causality running from national output to government spending, hence validating Wagner's proposition that as national output increases, there is tendency for government spending to increase proportionately. The implication of this result is that fiscal policy management has to be directed towards stimulating national productivity which will lead to increase in per capita income, increase in demand and consequently job creation.

The determinants of government expenditure in South Africa from 1960 to 2007 were the subject of investigation by [6] using co integration and error correction econometric tool of analysis to examine the variables incorporated in the model. The co integration result indicates a long run equilibrium relationship among the variables in the model, indicating that the results can be relied upon in taking long run policy decisions in the economy. The findings also indicate that per capita government expenditure was affected positively by external shocks. The authors contended that fiscal illusion plays a role in expanding government spending, advocating transparency and accountability in tax administration, so that the average tax payer should have sufficient information when evaluating the contributions of her taxes in government overall spending, especially when it has to do with any form of indirect tax.

[8] investigated the causality between public expenditure and national income using panel data methodology for Nigeria, Ghana and South Africa from 1970 to 2012. The study adopted Johansen Fisher Panel Co integration Test jointly and on individual basis adopted time series Johansen-Juselius co integration techniques. The study obtained the following results. The panel co integration results indicate a long run relationship between government spending and national income in the whole panel indicating that the result can be relied upon in taking long run decision in the economy. The Johansen-Juselius co integration test indicate the presence of long run relationship between government spending and national income only for Ghana in line with Wagner's theory indicating that public expenditure has no impact on economic growth in the long run in Nigeria and South Africa. The study found evidence of bi-directional causality for the whole panel. Additionally, the result from the causality test shows that there is a bi-directional causality that runs from national income to government expenditure and vice versa for Nigeria and South Africa. However, for Ghana, there was a unidirectional causality that runs from government expenditure to national income and there is no feed-back mechanism. The study concluded that Government spending enhances national income in the short run for Nigeria and South Africa. The implication of the result of the analysis is that for Nigeria and South Africa, government expenditure increases proportionately with increase in national output, while in Ghana government expenditure triggers the growth in national output.

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[18] adopted regression analysis to investigate the effect of social sector development and national output with stress on intermediary role of technology in Pakistan. The study found existence of LR correlation between human capital and national output and short run association by using error correction model. This means that results of the estimation can be relied upon in taking long run decisions in the economy.

[19] explored the relationship involving investment in human capital and economic growth in Nigeria, using causality and vector auto regression approach. The study reveals that causality runs from investment in human capital to national output. This implies that human capital development contributes significantly to the growth of national output and suggests that government fiscal policy measures

should emphasize the overall development of the human capital and social sectors of the economy.

[20] carried a research on foreign aid, public spending and national output. Overseas aid represents an important source of funding in most countries in Sub-Sahara Africa (SSA), including Nigeria, where it bridges the gap of low savings, thin export earnings and skeletal tax bases. Foreign aid is observed to be a key enhancement to public expenditure in Nigeria. Foreign aid as a result, can have positive outcome on economic growth, by means of public expenditure if appropriately channeled to the productive sectors of the economy. The finding of the research reveals that foreign aid and public expenditure impact positively on national output, with foreign aid indicating a very significant impact on growth. The implication of this result is that government fiscal policy measures should be used to create a cordial relationship with advanced economies and donor agencies by the regular payment of government cash counterpart contributions so as to enhance the flow of foreign aids into the Nigeria economy.

The effect of public spending on national output in Nigeria was carried out by [21] spanning across 1977 to 2012 adopting a sectoral approach to the analysis of the variables in the model. Agreeably, the study emphasizes that fiscal policy management has remained a veritable tool for promoting productivity both in advanced and emerging economies. Ex-post facto research design was adopted in the study while co integration and vector error correction econometric tool of analysis were adopted to estimate the time series data included in the model. The resultant outcome of the estimation shows that total education spending has significant impact on national output in the long run. The authors suggest that the results indicate that there is need to reexamine our budgeting system in terms of the methodology of appraising budget performance in Nigeria. It is suggested by the study that both exogenous and endogenous factors impact significantly on public spending in Nigeria. The study also advocated for a radical reduction on recurrent budgetary allocation and an increase in capital provision in the education sector and a systematic scaling up of capital investment in Nigeria so as to increase the stock of domestic capital in order to stimulate growth and create employment in the economy.

With an annual data of thirty nine years from 1970 to 2008, [22] considered the LR and probable causality between public spending and national output in Nigeria. Co integration and Granger causality econometric tools of analysis were adopted in the model estimation. The findings indicated a significant positive correlation between public expenditure and national output. The authors reported a significant positive LR impact between population growth rate and national productivity in Nigeria. Granger causality test show considerable bidirectional causality at 10% level, government spending to national output and from national output to government spending. This means that fiscal policy and public expenditure management can be applied to address public spending and economic growth issues concurrently since both of them granger causes each other.

The applicability of either Wagner's law or Keynes theory in Ghana, Kenya and South Africa was the subject of consideration by [1] using granger causality econometric technique. The study found no support for the theories in either of the countries hence concluding that both Wagner's law and Keynes theory does not hold as postulated. The implications of this result is that they will be no predetermined policy direction to be followed by the fiscal policy and public expenditure managers, rather discretionary fiscal policy measures will have to be applied as occasion demands and based on the economic need of the time.

With the application of time series data in India from 1973 to 2012, [23] considered whether causality exist in the economy between total national expenses and national productivity. Outcome of the investigation further confirm a unidirectional causality moving from national output to total national expenses in the economy validating the applicability of Wagner's theory. The economic implication of the above result is that fiscal policy tools should focus on stimulating national output, so that per capita income will rise and demand for goods and services will rise also. Efforts must also be geared towards enhancing sources of internally generated revenue to complement alternative revenue sources for the India government so as to minimize deficit financing options.

[24] studied public expenditure in Nigeria as a means for economic growth and development for a period covering 1980 – 2009. The pre-estimation test for the study was carried out

using Philip Peron unit root test in other to determine the stationary of the data to avoid spurious regression. Co integration approach was used to determine the degree of long run relationship among the variables in the model, while the error correction model was applied to determine the speed of adjustment between the short run and long run intervals. Total capital expenditure, inflation rate, degree of openness and current government revenue were included in the model as explanatory variables and all show significant relationship with national output. The study suggested fiscal and monetary policy mix in addition to discretionary policy approach in the management of the economy in other to realize set fiscal policy targets.

Concerned with overall impact of public health costs and health outcome and its likely impact on governance, [25] undertook a research making use of various econometric tools of analysis. The authors contended that achievement of broad based health target correlates with the realization of broad economic goals in every economy. It is this philosophy the study argued that encourages countries to invest a high chunk of their public fund into the health sector, even though in most developing economies, the study contends that this huge investment in the health sector has not translated to improved health status blaming poor governance for this ineffectiveness.

The causality between public expenditure and national output was the subject of investigation by [26] using time series statistics spanning from 1977 to 2009 on the variables incorporated in the model and co integration and granger causality econometric technique to determine the overall impact of public cost outlays on national productivity, with RGDP, private investment and human capital as explanatory variables. The result of the pre-estimation test revealed that all the variables were stationary at first difference. Co integration test also show evidence of long run equilibrium relationship among the variables at both 5% and 10% significant level. The findings based on ECM indicate an insignificant impact of private and public investment on national output. The economic implication of this finding is that public spending throughout the review period failed to stimulate national output significantly. Therefore, public expenditure and overall fiscal policy managers must strive to apply relevant fiscal policy tools to address this gap and ensure that capital investment procedures are made more transparent. There is also the need to ensure that the government

operates a balanced budget until there is clear evidence that spending has begun to produce results in the economy before deficit financing options can be considered.

Government spending, corruption and national productivity in Italy was the subject of consideration by [27] using panel data technique to estimate statistics from twenty regions. The role of the public service in stimulating private investment was extensively considered in the research, especially how contemporary private productive ventures boost internally generated revenue through taxes collected from those medium and micro business. Therefore, if this process is influenced by corruption, the revenue accruable to government will be affected and government capacity to incur expenditure will decline drastically. Usually, the government tends to redress this situation through monitoring of governmental activities which involves additional government expenditure. The research concludes that corruption impedes on the growth of the economy by eating up government revenue and by creating additional cost in the bid to fight the scourge. The study recommends that efforts should be directed towards making government business to be carried on transparently by strengthening institutional capacities.

3.1 Model Specification

This study employs a multiple linear regression analysis adopted from the Keynesian investment expenditure framework in a money economy which states that a decrease in consumption and subsequent increase in savings will increase investment, therefore causing a decrease in total expenditure. He equated the expenditure model as;

$$TE = C + I + G + (EX - IM) \tag{7}$$

He maintained that an economy is at equilibrium when

$$TE = TP = RGDP \tag{8}$$

Where

TE = Total Expenditure, TP = Total Production, RGDP = Real gross domestic product, C = Consumption, I = Investment, G= Government expenditure, EX = Export and IM = Import
This can be transformed as;

$$Y = C + I + G + (EX - IM) \tag{9}$$

This implies that expenditure of an economy brings increase in production which in turns give rise to RGDP and disequilibrium in an economy exists if;

$$TE < TP \tag{10}$$

Considering the variables of this study, the model is transposed in the functional form as;

$$RGDP = f (TGEX, TREV GDP, INF) \tag{11}$$

and expressed in a linear regression form as'

$$RGDP_t = \alpha_0 + \alpha_1 TGEX_{t-1} + \alpha_2 TREV GDP_{t-1} + \alpha_3 INF_{t-1} + \epsilon_t \tag{12}$$

where;

RGDP represents real gross domestic product, TREV GDP refers to total revenue as percentage of gross domestic product, INF means Inflation, ϵ_t is the error term and $\alpha_0... \alpha_3$ are parameter.

3.2 Estimation Procedure

Government expenditure on economic growth in South Africa was analyzed in this study using Johansson co-integration test, vector error correction mechanism (VECM) approach. The VECM technique is used because it possesses statistical properties such as linearity, unbiasedness, minimum variance, zero mean value of the random term etc ([28] and [29]). However, the reliability of the variables in the model was identified by a unit root test with Augmented Dickey Fuller and Philip Perron test.

The unit root test of the DF and ADF are respectively as follows:

$$pU_t = \Phi U_{t-1} + dT \tag{13}$$

$$pU_t = \Phi U_{t-1} + \sum \delta_i pU_t + dT \tag{14}$$

3.3 Co-integration Test

Co integration test indicates its significance through the trace or rank statistics and the probability values of variables under consideration [30]. It is therefore estimated thus;

$$Y_t = \mu + \Delta_1 Y_{t-1} + \dots \dots \dots \Delta_p Y_{t-p} + \epsilon_t \tag{15}$$

3.4 Vector Error Correction Mechanism

The error correction mechanism is introduced in an estimation when variables maintains the same order of integration and verifies if short and long run relationship exist among variables. This test also indicates the speed of adjustment of an economy from disequilibrium to equilibrium point and the higher the coefficient of the R². The ECM is expressed thus;

$$\Delta y_t = \delta + \delta y_{t-1} + \sum \Phi_i^* \Delta y_{t-1} + \varepsilon_t \quad (16)$$

Where Δ is the differencing operator, such that $\Delta y_{t-1} = y_t - y_{t-1}$, δ_{t-1} are the error correction terms

Introducing the variables in consideration in the model, we have,

$$\begin{aligned} \Delta \text{RGDP}_t = & \delta + \rho y_{t-1} + \sum \Phi_i^* \Delta \text{RGDP}_{t-1} + \\ & \sum \Phi_i^* \Delta \text{TGEX}_{t-1} + \sum \Phi_i^* \Delta \text{TREVGDP}_{t-1} + \sum \Phi_i^* \\ & \Delta \text{INF}_{t-1} + \xi_t \end{aligned} \quad (17)$$

3.5 Granger Causality Model

Short-run causality is established by the analysis of the joint significance of the lagged explanatory

variable and movements of the deviations from the long-run path are explained by long-run causality. The study tries to find the causality direction between the two variables, government expenditure and economic growth in South Africa by using Granger causality methodology. This model is expressed in two equations as;

$$Y_t = \alpha_0 + \sum_{i=1}^n \alpha_i Y_{t-1} + \sum_{j=1}^n \beta_j X_{t-1} + \varepsilon_{1t} \quad (18)$$

$$X_t = \lambda_0 + \sum_{i=1}^n \lambda_i Y_{t-1} + \sum_{j=1}^n \partial_j X_{t-1} + \varepsilon_{2t} \quad (19)$$

The ADF and Philip Peron results above shows that all the variables in consideration are not stationary at levels, however, the variables were integrated of the same order at first difference. The result is validated by their individual coefficients and p values.

The trace statistics of the co integration test indicated one co integrating vector as shown above. The result also show the co integrating equation through the normalize co integrating coefficients.

Table 1. Augmented dickey fuller unit root test

Trend and Intercept @ Levels

Series	ADF test statistic	5% critical values	10% critical values	P.val	Rmks
RGDP	-0.059426	-3.515523	-3.188259	0.9941	NS
TGEX	-0.228404	-3.515523	-3.188259	0.9904	NS
TREVGDP	-2.820795	-3.548490	-3.207094	0.2000	NS
INF	-3.034754	-3.515523	-3.188259	0.1347	NS

Sources: Researcher's compilation from E-view (version 7.0)

Table 2. Augmented dickey fuller unit root test

Trend and Intercept @ 1st Diff

Series	ADF test statistic	5% critical values	10% critical values	P.val	Rmks
RGDP	-4.442067	-3.518090	-3.189732	0.0051	ST
TGEX	-4.764063	-3.518090	-3.189732	0.0021	ST
TREVGDP	-5.593881	-3.552973	-3.209642	0.0003	ST
INF	-5.692241	-3.518090	-3.189732	0.0001	ST

Sources: Researcher's compilation from E-view (version 7.0)

Table 3. Philip perron unit root test

Trend and Intercept @ Levels

Series	ADF test statistic	5% critical values	10% critical values	P.val	Rmks
RGDP	-0.294655	-3.515523	-3.188259	0.9884	NS
TGEX	-0.433534	-3.515523	-3.188259	0.9831	NS
TREVGDP	-2.602572	-3.548490	-3.207094	0.2816	NS
INF	-3.188459	-3.515523	-3.188259	0.1347	NS

Sources: Researcher's compilation from E-view (version 7.0)

Table 4. Philip perron unit root test

Trend and Intercept @ 1st Diff

Series	ADF test statistic	5% critical values	10% critical values	P.val	Rmks
RGDP	-4.309545	-3.518090	-3.189732	0.0073	ST
TGEX	-4.559427	-3.518090	-3.189732	0.0037	ST
TREVGDP	-6.275843	-3.552973	-3.209642	0.0001	ST
INF	-7.946719	-3.518090	-3.189732	0.0000	ST

Sources: Researcher's compilation from E-view (version 7.0)

Table 5. Co integration test

Unrestricted Co integration rank test (Trace)				
Hypothesized	Trace		0.05	
No. of CE(s)	Eigen value	Statistic	Critical Value	Prob.**
None *	0.571306	49.30712	47.85613	0.0363
At most 1	0.369883	21.35570	29.79707	0.3358
At most 2	0.169085	6.114661	15.49471	0.6820
At most 3	6.53E-05	0.002155	3.841466	0.9593

Trace test indicates 1 co integrating eqn(s) at the 0.05 level
 * denotes rejection of the hypothesis at the 0.05 level
 **MacKinnon-Haug-Michelis (1999) p-values

1 Co integrating Equation(s):			
	Log likelihood		
	-1779.954		

Normalized co integrating coefficients (standard error in parentheses)

RGDP	TGEX	TREVGDP	INF
1.000000	-0.841406 (0.03313)	7.18E+09 (7.9E+09)	2.85E+09 (3.8E+09)

Table 6. VECM - lower chamber

Error correction:	Coefficient	Std. Error	T – statistics	P – values
ECT (-1)	-0.002903	0.001251	-2.320264	0.0300
D(RGDP(-1)) = C(2)	0.093701	0.483703	0.193716	0.8482
D (TGEX (-1)) = C (4)	0.105203	0.285151	0.368936	0.7157
D (TREVGDP(-1)) = C (6)	4.97E+08	7.16E+09	0.069428	0.9453
D (INFL (-1)) = C(8)	-6.85E+09	3.78E+09	-1.813052	0.0835
C = C (10)	4.62E+10	1.87E+10	2.475108	0.0215

$R^2 = 0.568959$, F statistics = 3.226585, Prob (F -statistic) = 0.012008, $DW = 1.786409$

Table 7. Pair wise granger causality

Null hypothesis:	Obs	F-Statistic	Prob.
TGEX does not Granger Cause RGDP	33	2.98817	0.0666
RGDP does not Granger Cause TGEX		5.45824	0.0100
TREVGDP does not Granger Cause RGDP	33	0.22833	0.7973
RGDP does not Granger Cause TREVGDP		5.67526	0.0085
INF does not Granger Cause RGDP	33	10.0500	0.0005
RGDP does not Granger Cause INF		2.53160	0.0976
TREVGDP does not Granger Cause TGEX	33	0.01076	0.9893
TGEX does not Granger Cause TREVGDP		5.91778	0.0072
INF does not Granger Cause TGEX	33	5.40372	0.0104
TGEX does not Granger Cause INF		1.17228	0.3244
INF does not Granger Cause TREVGDP	33	6.28792	0.0056
TREVGDP does not Granger Cause INF		4.00496	0.0295

4. DISCUSSION/ IMPLICATIONS OF RESULTS

The non existence of unit root in the model as explained by the ADF test above prompted the investigation of long run influence of the independent variables on the dependent variable. The Johansen co integration table above reveals one (1) co integrating vector, which depict a long run equilibrium relationship between public expenditure and other explanatory variables. This result agrees with the result of [6] and [8] who reported long run relationship between public expenditure and economic growth in South Africa.

The Error correction term met the required conditions. The significance of rule of ECM holds that negative and statistical significant error correction coefficients are necessary conditions for any disequilibrium to be corrected. In light of this, the coefficient of ECM(-1) is -0.002903 The negative sign of the coefficient satisfied one condition while the fact that its P-value [0.0300] is less than 5% [0.05] level of significance satisfied the second condition of statistical significance. The coefficient indicated that the speed of adjustment between the short run dynamics and the long run equilibrium is 0.02%. Thus, ECM will adequately act to correct any deviations of the short run dynamics to its long-run equilibrium by 0.02% annually.

The computed coefficient of multiple determination (R^2) value of 0.568959 indicated that the model satisfied the requirements for goodness of fit. The computed statistics showed that 56.9% of the total variation in gross domestic product is accounted for by the explanatory variables: public expenditure, total revenue as a

percentage of GDP and inflation while 43.1% of the changes in gross domestic product are attributable to the influence of other factors not included in the regression equation.

The F – statistics of 3.226585 with p value of 0.012008 which is less than 0.05 shows that the influence of explanatory variables on the dependent variables is statistically significant. This implies that all the independent variables have a joint influence on the dependent variable as explained by R^2 coefficient of 0.568959. The DW has the value of -1.786409 which indicates the absence of auto correlation among the residuals.

The result of the error correction model from the normalized co integration equation and upper chamber of the ECM indicate a long run significant positive relationship between total revenue as percentage of GDP (TREVGDP) and economic growth showing as expected that increase in government revenue leads to increase in the growth of the economy. The result also indicates a positive significant relationship between inflation and the growth of the economy, in agreement with the opinion of this study that a certain level of inflation within the single digit is necessary for the growth of any economy.

The pair wise granger causality test of the variables indicate one way causality moving from gross domestic product to total government expenditure in validation of Wagner’s law in the economy within the time of the study .Causality was also found from gross domestic product to government revenue without feedback mechanism showing that the growth in the economy leads to increase in government

revenue. In conformity with the VECM result causality was found from inflation to gross domestic product, showing that inflation can lead to the growth of the economy in both the long run and short run.

5. CONCLUSION

In view of the above results the study concludes that a stable long run relationship exists between public expenditure and economic growth in South Africa within the period of the study and that the growth in national income in the long run leads to increase in government expenditure as implied by Wagner's hypothesis in South Africa. The study consequently recommends a conscious strategy by the South Africa fiscal authorities aimed at increasing the growth of the economy by increasing internally generated revenue.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Ansari MI, Gordon DV, Akuamoah C. Keynes versus Wagner: Public and expenditure national income for three African countries. *Applied Economics*. 2010;29(4):543-550.
2. Odhiambo NM. Government expenditure and economic growth in South Africa. An emirical investigation. *Atlantic Economic Journal*. 2015;43(3):393-406.
3. Usman A, Mobolaji HI, Kilishi AA, Yaru MA, Yakubu TA. Public expenditure and economic growth in Nigeria. *Asian Economic Finance Development*. 2011; 1(3):104-113.
4. IMF. Rebalancing growth: World Economic Outlook (WEC). World Economic and Finance Surveys; 2010.
5. Central Bank of Nigeria. Statistical bulletin; 2011. Available:<http://www.cbn.gov.ng>
6. Alm J, Embaye A. Explaining the growth of government spending in South Africa, Economic Society of South Africa. *South African Journal of Economics*. 2010;78:2.
7. Menyah K, Wolde-Rufael Y. Wagner's law revisited: A note from South Africa. *South African Journal of Economics*. 2012;80(2): 200-208.
8. Felix O, Sabtis A. Government spending and National income: A time series and panel analysis for Nigeria, Ghana and South Africa. *Research Journal of Finance and Accounting*. 2014;5(14).
9. Alimi RS. A time services and panel analysis of government spending and national income. MIRA Paper 56994. Pdf; 2014.
10. Statistics South Africa; 2014.
11. Government finance statistics of South Africa (1980 – 2011).
12. Buchanan JM, Wagner RE. *Democracy in deficit: The political legacy of Lord Keynes*. Indianapolis, IN: Liberty Fund, Inc. 1977;8.
13. Henrekson M. Wagner's law – A spurious relationship? *Public Finance*. 1993;48:406-415.
14. Ogbonna BC. Does the Wagner's law hold for Nigeria? 1950-2008. *Journal of Research in National Development*. 2012;10(2):290-299.
15. Goffman JJ, Mahar DJ. The growth of public expenditure in selected developing Nations: Six Carribean countries. *Public Finance /Finances Publique*. 1971;26(1): 57-74.
16. Bird RM. Wagner's law: A pooled time series and cross section comparison. *National Tax Journal*. 1971;38:209-218.
17. Dhires K. Relationship between economic growth and public expenditure through Wagner's law: An analytical study in India perspective. *International Journal of Entreprenueship and Business Environment Perspectives*. 2013;2(4).
18. Muhammed A, Bilah M, Muhammed S. Impact of human capital on economic growth with emphasis on intermediary role of echnology: Time series evidence from Pakistan. *African Journal of Business Management*. 2012;6:280-285.
19. Ditimi A, Nwosa PI. Investment in human capital and economic growth in Nigeria using causality approach CS Canada. *Canadian Social Science*. 2011;7(4):114-120.
20. Abidemi OI, Logile AI, Olawale AL. Foreign aid, public expenditure and economic growth: The Nigeria case. *Journal of Applied Business Research*. 2011;27(3): 33.
21. Chude NP, Chude DI. Impact of government expenditure on economic growth in Nigeria. *International Journal of Business and Management Review*. 2013;1(4):64-71.
22. Turkur G, Sabi A. Public expenditure and economic growth: An application of co-

- integration and granger causality test on Nigeria. *Journal of Economic and Social Research*. 2013;15(1):1-30.
23. Srinivasan P. Causality between public expenditure and economic growth: The Indian case. *International Journal of Economics and Management*. 2013;7(2): 335–347.
24. Taiwo AS, Agbatogun KK. Government expenditure in Nigeria: A sine qua non for economic growth and development. *Journal of Research in National Development (JORIND)*. 2011;9(2):155-162. Jorinda G. ISSN 1596-8308. Available: www.ajoi.info/journals/jorand
25. Yaqub JO, Ojapinwa TV, Yussuf RO. Public health expenditure and health outcome in Nigeria: The impact of governance. *European Scientific Journal*. 2012;8(13).
26. Olukayode EM. Does government spending spur economic growth in Nigeria? *Munieh Personal RepeEc Archive*; 2009.
27. Alfredo D, Erasmo P. Public expenditure, corruption and economic growth: The case of Italy. *European Journal of Political Economy*. 2001;17(1):1-16.
28. Koutsoyiannis A. *Theory of econometrics: An introductory exposituin of econometrics methods*. London Macmillian Press; 2003.
29. Gujarati D, Sangeetha. *Basic econometrics*. New Delhi: Tata McGraw-Hill, Fourth Edition; 2005.
30. Johansen S, Juselius K. Maximum likelihood estimation and inference on co integration: With the application to the demand for money. *Oxford Bulletin of Economics and Statistics*. 1990;52:169-209.

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