EFFECT OF GOVERNMENT PHYSICAL INFRASTRUCTURE EXPENDITURE ON ECONOMIC GROWTH IN RWANDA

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The Strategic JOURNAL of Business & Change MANAGEMENT
ISSN: 2312-9492 www.strategicjournals.com

Vol. 9, Iss. 2, pp 1355 – 1367. June 11, 2022. www.strategicjournals.com, ©Strategic Journals

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Accepted: June 2, 2022

ABSTRACT

The goal of this research was to investigate empirically how government expenditure contributes to economic growth in Rwanda. Most existing studies on the association between government expenditure and economic growth show conflicting results and mainly focus on developed economies. Hence this study focused on both the functional and composition of public spending of the Rwanda over the period from 2006-2021, with a particular focus on sectoral expenditures: Education, Agriculture, Defense and Health. The objective of the study was to establish these government expenditure components that have effects on economic growth using panel data series for Rwanda (for 15 years) in order to provide a guide for policy formulation. The study used the neoclassical augmented Solow growth theory as the theoretical framework. In this study, both descriptive and econometric inferential analyses were carried out. In the econometric analysis, total government expenditure was disaggregated to scrutinize the effect of different components of public spending on economic growth. The study used secondary data which was obtained from sources such as the specific countries Bureau of Statistics, Statistical abstracts and World Bank. Employing Levin-Lin-Chu test, this study tested for panel unit root and found that only two variables, that is, real GDP growth and investment expenditure are stationary at level while others were stationary at the first difference level. The collected data was estimated by balanced panel fixed effect model. The findings showed that expenditures on health, defense and investment were found to be positive and statistically significant effect on economic growth in Rwanda. In contrast, expenditure on consumption was found to be negative and statistically significant effect on economic growth. Finally, education, agriculture and human capital expenditure were found to be insignificant. This study suggested that for Rwanda, the policy of increasing government spending on health and investment budget to promote economic growth will be appropriate, but fewer funds should be channeled towards other governmental programs.

Keywords: *Government Physical Infrastructure Expenditure, Economic growth, Rwanda*

CITATION: Rusanganwa, E., & Mulyungi, P. (2022). Effect of government physical infrastructure expenditure on economic growth in Rwanda. *The Strategic Journal of Business & Change Management,* 9 (2), 1355 -1367.

Background of the Study

Economic theory does not automatically generate strong conclusions about the effect of government expenditure on economic performance. Indeed, most economists would agree that there are circumstances in which lower levels of government spending would enhance economic growth and other circumstances in which higher levels of government spending would be desirable. If government spending is zero, presumably there will be very little economic growth because enforcing contracts, protecting property, and developing an infrastructure would be very difficult. In other words, some government spending is necessary for the successful operation of the rule of law (Mitchell, 2005).

The role of government in economic growth is an issue of debate since the time of Adam Smith. Recent wave of privatization in many developing and developed countries is based on perceptions that, "for sustainable development and efficient output, the role of government in economic policies should be reduced"(Kakar, 2011). Economists are of two different views about the role of government in economic activities. According to the neoclassical economists, reducing the role of private sector by crowding-out effect is important because it reduces the inflation in the economy; increase in public debt, increases the interest rate which reduces inflation in the economy as well as output. The new-Keynesians present the multiplier effect in response and argue that the increase in government expenditure will increase demand and thus increase economic growth. The vision of ensuring sustainable economic development and reduction of mass poverty is enshrined, in one way or another, in the government's development strategy documents of virtually all developing economies. In this respect, economic growth, which is the annual rate of increase in a nation's real GDP, is taken as main objective for overcoming persistent poverty and offering hope for the possible improvement of society (Kakar, 2011).

Faced with the financial crisis and global economic recessions, governments have rediscovered the importance of public finance. They use it to rescue the bankrupt banks, and to create more economic activity to hold back recession. Tens of millions of workers are in jobs today and would be unemployed without that economic boost from public spending. But now there is a backlash demanding that the deficits used to create the stimulus must be cut back by cutting public spending on a grand scale. The backlash comes not only from governments, but from international institutions, led by the International Monetary Fund (IMF) and World Bank (WB), which are insisting that public services are now 'unaffordable', and that healthcare, education and pensions in particular should be dependent on the market (Mitchell, 2005).

The relationship between government expenditure and economic growth has continued to generate a series of controversies. While some researchers conclude that the effect of government expenditure on economic growth is negative and insignificant (Akpan, 2005) and (Romer, 1990), others indicate that the effect is positive and significant (Korman and Bratimaserene, 2007) and (Gregorious and Ghosh, 2007). Government expenditure on investment and productive activities is expected to contribute positively to economic growth, while government consumption spending is expected to be growth retarding. This instrument of fiscal policy promotes economic growth in the sense that public investment contributes to capital accumulation. Other importance of government expenditure includes the provision of those facilities that are not fully covered by the market economy such as health and education. That is, human capital promotes positive benefits associated with economic growth, but the financial source for public expenditure which is taxation, reduces the benefits of the taxpayers and as such reduces the benefits associated with economic growth (Barro, 1990).

After the genocide of 1994 which brought the Rwandan economy to grassroots, the government

embarked on reviving the economy through adopting measures that stimulates economic growth in various sectors of the economy. This called for expansion of government expenditure in various sectors of the economy in order to achieve a steady economic growth. Over the years government expenditure has grew more rapidly than the growth rate of GDP. This raises concern among policy makers and requires an investigation as to why GDP is growing at a slower rate despite the government effort to expand its expenditure in order to stimulate rapid economic growth. Given this fiscal scenario, there is need to study the impact of government expenditure on economic growth in order to explain the wide range difference between government expenditure growth rate and GDP growth rate.

The relationship between Government expenditure and economic growth is a key area of study. The question is whether government expenditure increases the long run steady growth rate. Generally, government expenditure on physical infrastructure and human capital speeds up growth though the sources of such finances can slow down growth (Landau, 1983; Devarajan, 1993; Cashin, 1995; Kneller, 1999). This is due to the negative impact of taxes for example on investment. High taxes discourage investments and this slows down economic growth (Musgrave and Musgrave, 1989). Government expenditure can increase output directly or indirectly through different ways as examined by Lin (1994). These ways include provision of public goods, social services like health and education and through promotion of exports by offering subsidies.

Government expenditure can impact positively or negatively depending on its form. According to Barro (1990), expenditure on investment and productive activities including state-owned production e.g. infrastructure, education should contribute positively to growth, whereas government consumption expenditure e.g. wages and salaries and public debt servicing is expected to be growth-retarding.

Government expenditure can contribute to economic growth directly or indirectly (Barro & Sala-i-Martin, 1992). According to Barro, direct effect is where government expenditure results to increase in physical and human capital stock reflecting higher flows of government funds, for example expenditure on education, health and physical infrastructure. An indirect effect can be seen on its impact on marginal productivity of production factors. For example expenditure on research and development improves the productivity of capital, labor. Similarly expenditure on security lowers production cost of firms in form of security expenses for the employees and assets.

There is growing evidence that suggest that in developing countries, externalities associated with infrastructure expenditure may be important in enhancing growth (Landau, 1985). Indeed, it has been found that infrastructure may have an impact on human capital as well. According to Moreno (2007), government expenditure on infrastructure affects growth not only through its direct impact on investment and the productivity of factors in the private sector, but also through health and education outcomes. Government expenditure that facilitates access to clean water and sanitation helps to improve health and thereby labor productivity. These expenditures can be in the form of provision of electricity, which is essential for the functioning of hospitals and the delivery of health services, and better transportation networks, which contribute to easier access to health care, particularly in rural areas. In addition, there is evidence of direct linkages between infrastructure and education. Education allows for more training and greater access to learning technologies. Enrollment rates and the quality of education tend to improve with better transportation networks, particularly in rural areas. Greater access to sanitation and clean water in schools tend to raise attendance rates, Stiglitz (1989).

According to Kosimbei (2013) and Maingi (2010), there are two major traditional approaches that analyses the effect of government expenditure on

economic growth. They include the Keynesian approach and the monetarist approach. Keynesians believe that the key to both a healthy economy and correcting recessions and depressions is doing whatever it takes to entice consumers to continue spending. According to Keynes, during recession, households save more than they consume. This is due to the fear of loss of job in the near future. This trend worsens the economy more since reduced consumption makes businesses to close down and hence investment falls. To break the cycle, Keynesian economists think that the government should increase its spending to compensate for the slowdown in aggregate demand. Government spending would help to boost productivity and therefore protect jobs, which in turn will help to drive more consumption, or spending, by consumers.

According to Monetarist approach led by Friedman, sustained money growth in excess of the growth of output produces inflation (Branson, 1989). To reduce inflation, the growth in the money supply needs to be controlled and thus the need to control or reduce government expenditure (Brunner and Meltzer, 1992). This theory further argues that tax financed government expenditure crowds out private investment (Ahmed, 1999). This is because when government expenditure is tax-financed, any extra expenditure calls for more taxation. A higher tax burden reduces the disposable income for individuals, which results to a reduction in consumption, lower savings and hence lower investment. On the other hand, higher tax burden on corporations and businesses result to decreased profits and thus reduces expansion and development aspects. If the government decides to borrow from money or capital market to finance its expenditure, it has a future obligation to repay the loan and its interest, which places a burden on the future generation. These factors result to crowding out of private investment in the course of funding government expenditure (Ahmed, 1999).

The modern approach states that labor force must be provided with more resources i.e. physical capital, human capital and technology for increased productivity to be achieved. This implies that the only way a government can affect economic growth, at least in the long-run, is via its impact on investment in capital, education and research and development. The approach makes improved education the key to achieving economic growth.

Trend in government expenditure and economic growth in Rwanda

The trend in government expenditure and economic growth in Rwanda is shown in the Figure 1.

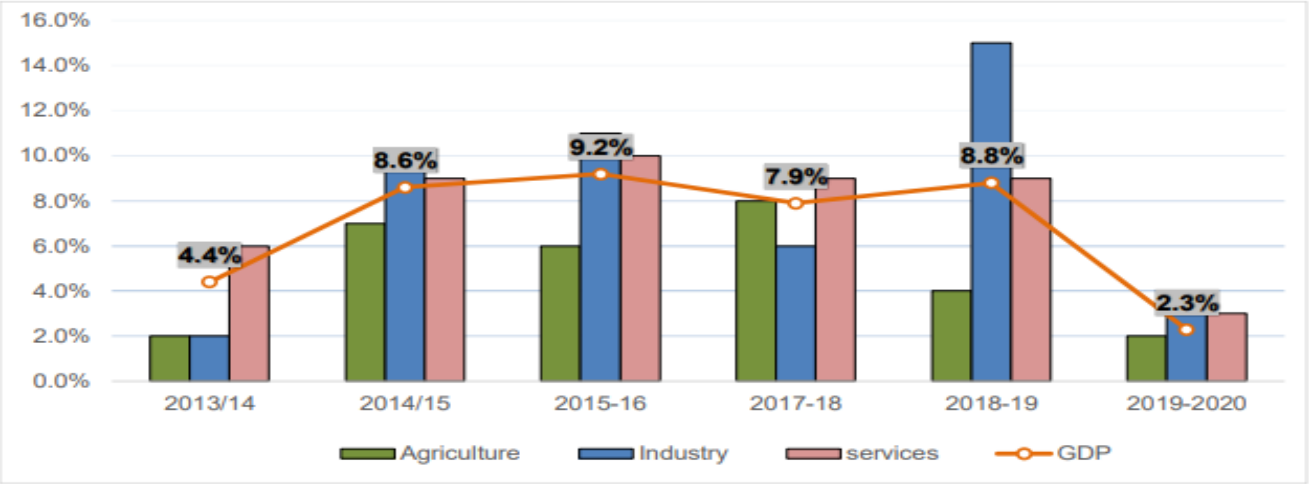

Figure 1: Real sector Growth (2013/2014 to 2019/2020)

Source: GDP and Public expenditure reports, NISR, 2021 and MINECOFIN

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From figure 1 above initially there was a sharp increase in government expenditure from 2005 to 2007.This was accompanied by a fall in the GDP growth rate. In 2007/2008 financial year government expenditure growth rate declined and then rose up in the following financial year, 2008/2009.This period saw a rise and a fall in GDP growth rate within the two years.

Followed was a downward trend in expenditure growth rate for the next 3 years which was accompanied by an increasing trend in GDP growth rate. There was a rapid increase and a fall in government expenditure growth rate from 2011 to 2013 accompanied by a slight increase and a fall in GDP growth rate. The last financial year was accompanied by a fall in government expenditure growth rate and a rise in GDP.

Generally the expenditure growth rate is greater than the GDP growth rate evidenced by the gap in the figure 1 above. There was a fluctuation in government expenditure growth rate during the period of study though there was an increasing expansion of government expenditure every year. The GDP growth rate is generally accompanied by a steady decline, a minimal rise and fall, steady increase overtime and then a minimal rise and fall. Expenditure growth rate was highest in 2011/2012 which was accompanied by a rise in GDP growth in line with the Keynesian theory that there a positive relationship between government expenditure and economic growth. The GDP growth rate was highest in 2008 though there was a decline in expenditure growth in the same year.

Trend in composition of government expenditure in selected sectors in Rwanda

In order to explain the growth in the overall government expenditure, we consider its breakdown into different categories. Government expenditure can be broadly classified in terms of purpose as development expenditure and recurrent expenditure. Capital expenditure refers to the amount spent in the acquisition of fixed (productive) assets (whose useful life extends beyond the accounting or fiscal year), as well as expenditure incurred in the upgrade/improvement of existing fixed assets such as lands , building, roads, machines and equipment, etc., including intangible assets. Expenditure in research also falls within this component of government expenditure. Capital expenditure is usually seen as expenditure creating future benefits, as there could be some lags between when it is incurred and when it takes effect on the economy. They are more discretionary and are made of new programs that are yet to reach their stage of completion, Ag'enor (2007)

Recurrent expenditure refers to expenditure of recurrent expenses that are less discretionary and are made on ongoing programs or activities. It constitutes of wages and salaries, administration, transfers payment, debt repayment and welfare services. Recurrent expenditure may affect economic growth through its effects on people's ability and willingness to work, save and invest Ag'enor (2007). Various ministries in Rwanda incur expenditures from government budget allocations which vary from one ministry to another every financial year (figure 2). This study concentrated on the following sectors namely, agriculture, sports and culture, health, education and infrastructure.

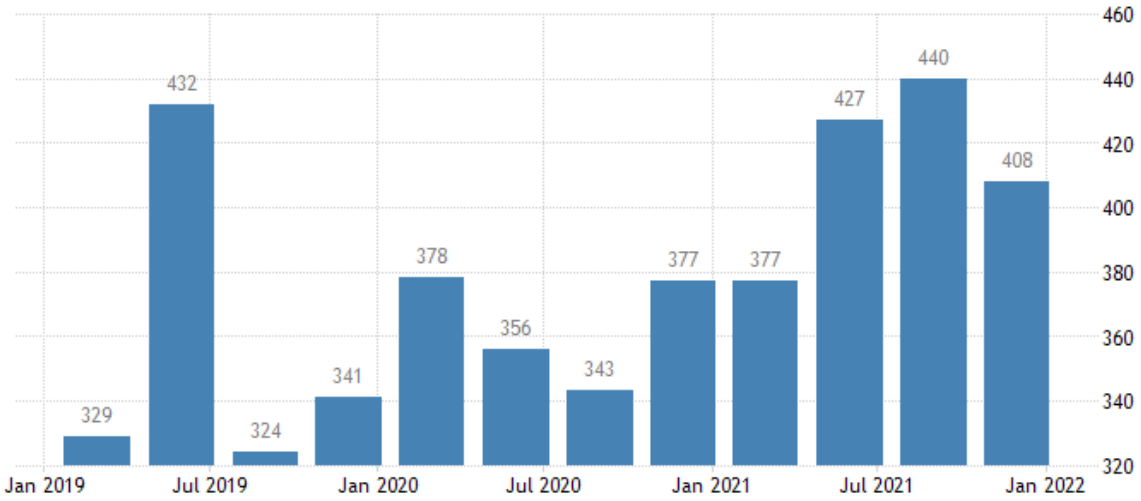

Figure 2: Distribution of public spending in selected sectors in Rwanda

Source: Public expenditure data reports from MINECOFIN

From the figure 2 above, the Rwandan government invested greater percentage of the budget on education and infrastructure sectors. Expenditure on education rose initially, decreased from 2007 and then started to rise again from 2009 reaching maximum in 2011 before exhibiting a downward trend for the remaining period. Infrastructure expenditure increased up to 2008 and started to fall before rising again after 2009 reaching a maximum in 2013 before dropping. Health expenditure remained fairly constant up to 2007, dropped and then started to rise again after 2008 until 2010 beyond which it exhibited a rise and fall every year for the rest of the period. Agriculture expenditure had an increasing trend up to 2010 after which showed a steady trend for the rest of the period. Sports and culture had a fairly constant trend with expenditure taking less than 2% of the total budget execution within the study period

Statement of the Problem

The steady rise of government expenditure for many years, in most countries, demonstrates a commanding link between public spending and economic development (Korman & Brahmasrene, 2007). However, most developing countries face a heavy debt burden, high rate of inflation, budget deficit and balance of payment deficit. This may be as a result of poor domestic policies or external shocks. Generally, the main problem is argued to be the ever increasing government expenditure. This higher spending undermines economic growth by transferring scarce resources from the productive sector of the economy to less productive sectors, which uses them less efficiently.

The causes of much of the variations in economic growth rate and expenditure growth rate in Rwanda are not well understood. Particularly, the effect of government expenditure on economic growth has not been explored well. Several studies have been carried out on government expenditure and economic growth in several countries and they give different findings. (Landau, 1983; Diamond, 1984; Barro, 1990; Davarajan *et al.* 1993; Kweka, 1995; Colombier, 2000; Maingi, (2008), Njuguna, (2009). From these studies, the effect of government expenditure on economic growth appears unconvincing. Despite this uncertainty, theory tells us that government expenditure has a positive effect on economic growth (Keynes, 1936; Solow-Swan, 1956; Musgrave and Musgrave, 1989; Barro, 1990; Barro and Salai-i-Martin, 1992, and 1995).

In Rwanda, government expenditure has been rising rapidly for the last ten years as a move by the government to stimulate economic growth. The impact of these increases in government expenditure on economic growth appears to be

minimal as shown by a steady but slow economic growth rate. The government of Rwanda spends substantial amounts of money annually on physical infrastructure, agriculture and social sectors such as education, health care, sports and culture, public order and national security, defense and general administration as evidenced by budget execution. From theory, when there is an increase in government expenditure in these sectors, it is expected that the economy will exhibit a rapid positive economic growth rate, but this does not seem to happen in Rwanda. This could be due to non-growth-enhancing expenditures that crowd-out outlays that are meant to boost economic growth (Colomber, 2000). Therefore, the issue of which government expenditure can foster permanent movements in economic growth in Rwanda becomes important and needs to be investigated.

Objectives of the Study

The general objective of the study was to analyze the effect of government expenditure on Rwanda economic growth during the period of 2006-2021. The specific objectives included:

- To examine the effect of government physical infrastructure expenditure on economic growth in Rwanda.

LITERATURE REVIEW

Wagner's theory

This theory was put forward by German political economist, Adolph Wagner (1835-1917). He argued that government growth is a function of increased industrialization and economic development. Wagner stated that during the industrialization process, as the real income per capita of a nation increases, the share of public expenditures in total expenditures increases. The law cited that "The advent of modern industrial society will result in increasing political pressure for social progress and increased allowance for social consideration by industry."

Wagner (1893) designed three focal bases for the increased in state expenditure. Firstly, during industrialization process, public sector activity will replace private sector activity. State functions like administrative and protective functions will increase. Secondly, governments needed to provide cultural and welfare services like education, public health, old age pension or retirement insurance, food subsidy, natural disaster aid, environmental protection programs and other welfare functions. Thirdly, increased industrialization will bring out technological change and large firms that tend to monopolize. Governments will have to offset these effects by providing social and merit goods through budgetary means.

In his Finanzwissenschaft (1883) and Grundlegung der politischen Wissenschaft (1893), Adolf Wagner pointed out that public spending is an endogenous factor, which is determined by the growth of national income. Hence, it is national income that causes public expenditure. This theory is relevant in Rwanda since the increased GDP of Rwanda overtime accelerated by industrialization has attracted more government expenditure in order to expand provision of public goods and other essential state services. Some of the flaws of this theory is that it concentrated on the demand side of the government expenditure while overlooking the supply side and it also dwelt on industrialization as the only driving force for increased public spending

Physical infrastructure expenditure

Ashauer (1989) conducted a study on the impact of government spending on economic growth in the united states of America and found that, expenditure on the main infrastructure (streets and highways, mass transit, water and sewage systems and electricity and gas supplies) had a powerful explanatory role in economic growth, while infrastructure such as police and fire stations, court houses office buildings etc. had a mild positive statistically significance impact on growth, while education infrastructure such as construction of classroom were statistically insignificant in impacting on economic growth.

Devarajan (1993) used functional categories of public expenditure in their economic growth regressions. The study found out that public expenditure had a negative impact on developing countries but had a positive impact on developed countries. The study had categorized expenditure into productive and non-productive categories by taking into account the level of resources invested and output produced by different programs. For instance the study reported that government expenditure on health and transport and communications to be growth promoting but found no positive impact of education and military spending on economic growth.

Conceptual Framework

A conceptual framework is a chart that explains the main things to be studied in conception. It provides the idea on establishing the relationship between the dependent and independent variables. It provides the primary model that provides the basis on deciding on the research question and objectives, and methodology to be followed in order to solve the phenomenon under investigation (Kothari, 2014). The conceptual framework that this study was based on is presented in Figure 3.

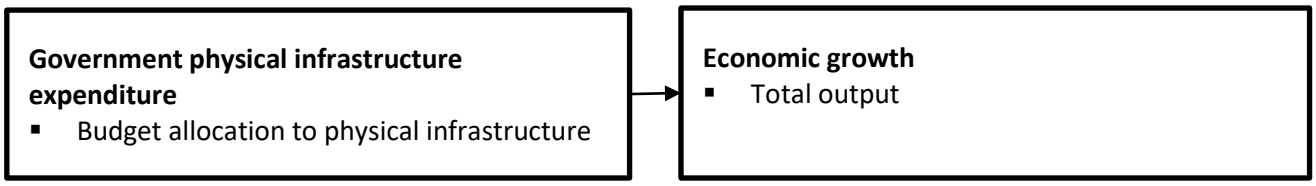

Figure 3: Conceptual framework

METHODOLOGY

The study employed an econometric model to study the relationship between the variables under study. VAR model was employed to assess the effects of government expenditure components on economic growth. The study employed historical research design so as to capture the trend of economic growth and government expenditure of Rwanda. Similar method was used by other researchers like Albala (2001) in Chile, Fasoranti (2012) in Nigeria, Maingi (2010) in Kenya, (Sharabati et al*.,* 2010) in Jordan.

The study used time series secondary data. Government expenditure was classified in terms of budget execution in selected sectors in Rwanda. These are agriculture, health, sports and culture, education and physical infrastructure. Quarterly data on these variables was obtained from Ministry of Finance and Economic Planning (MINECOFIN) for the 2006-2021 using secondary data and fixed balanced panel data analysis. Economic growth was in terms of GDP output within the study period. The data was obtained from National Institute of Statistics of Rwanda annual report data base.

The theoretical framework that the study was based on is Keynesian theory. Keynesian theory states that public expenditure determines economic growth. During recession a policy of budgetary expansion should be undertaken to increase the aggregate demand in the economy thus boosting the Gross Domestic Product (GDP), the employment rises, income and profits of the firms increase, and this would result in the firm's hiring more workers to produce the goods and services needed by the government.

$Y = f(GE)$..... (1)

The Keynesian modeled economic growth as a function of public expenditure.

$Y = f(GE)$..... (2)

Jerono (2009) defined total public expenditure as a function of summation of all individual government expenditure in all components.

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GE = *f* (government expenditure in all components) ..... (3)

In this study, combining the two models will yield a richer econometric model that will facilitate estimation. The government expenditure (GE) *is* defined as the five components; this modification will help us investigate the impact of government expenditure on economic growth in Rwanda.

GE = *f* [(ei, eg, ed, eh, es), Ut]..... (4)

And because,

Y = *f (*GE*)* according to the Keynesian,

Hence

Y = *f* [(ei, eg, ed, eh, es), Ut].....(5)

$$Y = \beta 0 + \beta 1ei + \beta 2eg + \beta 3ed + \beta 4eh + \beta 5es + ut \quad \text{..... (6)}$$

Where;

Y = Gross domestic product

ei = Physical infrastructure expediture.

RESULTS AND FINDINGS

Impulse response function

The impulse response function traced the effects of one standard deviation shock on a variable on its own and on the other variables. The vertical axis shows the deviation from the baseline level of the target variable in response to a one standard deviation shock of the independent variable (Kigabo *et al,*. 2008).

The specific objectives of this study were to analyze the effects of government expenditure on various sectors on economic growth. The results were depicted by the following response functions of GDP and the various government sectors

Effect of agriculture expenditure on GDP

The effect of a one standard deviation shock to agriculture expenditure on GDP is shown in the figure 4

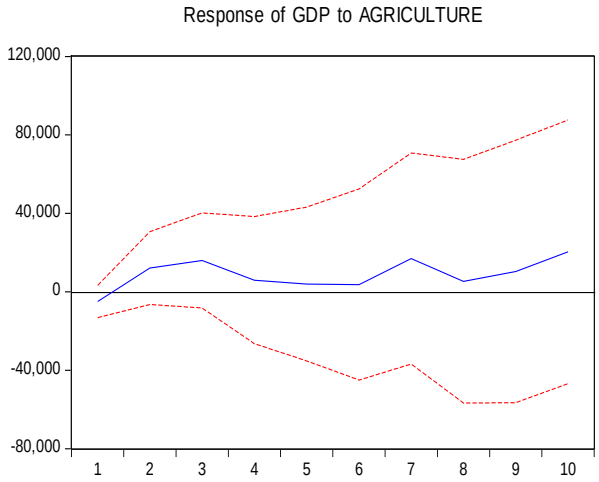

Figure 4: Effect of agriculture expenditure on GDP

Source: Constructed from the study data

There were fluctuations on the effects of agriculture expenditure on GDP throughout the study period though the variations were positive (blue line trend) showing that agriculture expenditure was significant in stimulating economic growth. There was appositive effect on GDP in case of a one standard deviation shock in agriculture expenditure. This could be due to the fact that increased agriculture expenditure improves the total agricultural output which increases aggregate domestic consumption and export earnings which adds to the GDP. Improved methods of farming through provision of quality seeds to farmers, fertilizer provision and bringing more land under agriculture could have necessitated this outcome. The results are similar to those of Abbas & Abdul (2016). They also found a positive relationship between agriculture expenditure and economic growth in Pakistan.

Effect of infrastructure expenditure on GDP

The effect of a one standard deviation shock to infrastructure expenditure on GDP is shown in the figure 5.

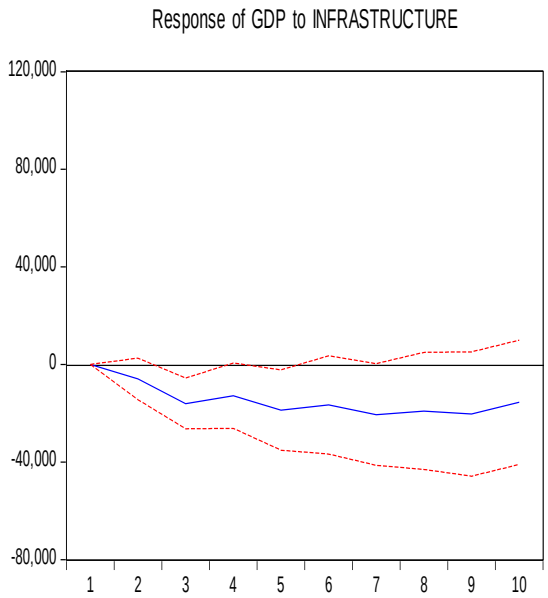

Figure 5: Effect of infrastructure expenditure on GDP

Source: constructed from the study data

The effects of infrastructure on economic growth remained fairly stable on the negative side throughout the study period exhibiting a decreasing trend initially and increasing trend from the 5th financial year as shown by the blue line below the base line in the above figure. This shows that infrastructure expenditure had a negative effect on GDP within the study period. A one standard deviation shock of infrastructure expenditure impacted negatively on economic growth.

This could be due to high expenditure on salaries and wages incurred on foreign firms given the tenders initially since Rwanda had shortage of skilled manpower on construction of roads and communication networking initially. This led to high capital outflow which could have impacted negatively on economic growth. The steady rise in the effects can be explained by the fact that Rwanda has improved her manpower and this has reduced the capital outflow though still not enough to foster positive effects.

Effect of education expenditure on GDP

The effect of a one standard deviation shock to education expenditure on GDP is shown in the figure in the next page.

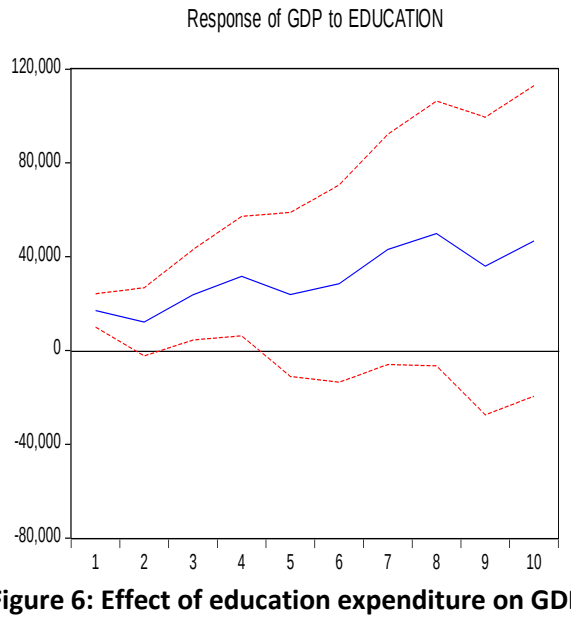

Figure 6: Effect of education expenditure on GDP

Source: constructed from the study data

The effects of education expenditure on GDP remained positive for the entire period as shown by the blue line in the above figure. A one standard deviation shock of education expenditure had a positive effect on GDP. Education expenditure contributed greatly to economic growth within the study period.

There were fluctuations on the effects but they generally exhibited an increasing trend with time depicted by increased gap between the baseline and the blue line.

This trend could be attributed to the increased skilled labour force (human capital) with time needed in the industry's leading to increased efficiency in production hence increased total output. This could have been achieved by carrying out awareness programmes on education, expansion of learning institutions right from primary to university, provision of appropriate physical infrastructure in schools, provision of high skilled manpower which ultimately increases the marginal productivity of labour, introducing fee guidelines in the learning institutions and finally increased number of government sponsored students to higher learning institutions. All these factors led to increased enrolment rate in the learning institutions creating a pool of skilled

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manpower required in both public and private sectors leading to increased GDP. The results are consistent with those of Mekdad (2014) who also found a positive relationship between education expenditure and economic growth in Algeria.

Effect of health expenditure on GDP

The effect of a one standard deviation shock to health expenditure on GDP is shown in the figure7.

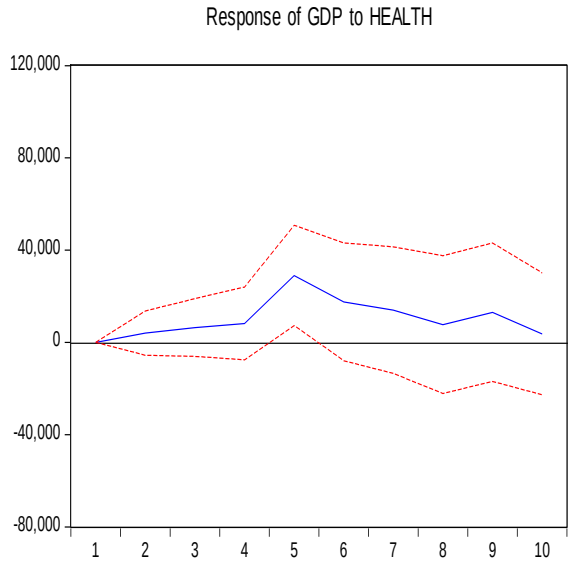

Figure 7: Effect of health expenditure on GDP

Source: constructed from the study data

The effects of a one standard deviation shock of health expenditure on GDP had an increasing trend up to the fifth financial year, a decreasing trend after up to eighth financial year then a rise and fall in the last two years. The effects were otherwise positive for the entire study period depicted by the blue line being on the positive side of the base line. This phenomenon could be due to the fact that health expenditure by the government raises the health status and productivity of the people, thereby promoting economic growth. The increased expectation of a longer life could affect the intertemporal discount rate and therefore savings. Increased health expenditure could increase the participation of women in the labour market, and affect fertility, which has effect on demographic transition and therefore on the economy. Further, government investments on buildings of hospitals represent expenditure on the core functions and therefore are expected to have a positive effect on the economy.

Effect of sports and culture expenditure on GDP

The effect of a one standard deviation shock to sports and culture expenditure on GDP.

The effect of a one standard deviation shock of sports and culture on economic growth was negative initially, became positive shortly then dropped again for some time till the 6th financial year before rising again. Generally there was fluctuation in the effects on both sides of the baseline for the entire period. This shows that sports and culture expenditure had mixed effects on economic growth.

The positive effects could be attributed to expansion of tourist sites and increased expenditure on promotion of sports activities which saw more Rwandese playing in foreign clubs which brings in foreign earnings for the country. Expansion of tourist sites and culture attracted more tourists hence increased foreign earnings. The negative effects could be attributed to low foreign earnings from tourism sector.

Discussion of Results

The study findings agree with Maingi (2010) while studying the impact of government expenditure on economic growth in Kenya found out that in the long run expenditure on economic affairs, defense, education, government investment, general administration and services and physical infrastructure have positive impacts on economic growth. In the short run health care, public order and national security have positive impact on economic growth, whereas, public debt servicing had negative impact on economic growth

From the results in the above table, GDP was affected by its own shocks which also affected other variables, these are agriculture, health, infrastructure, education and sports and culture. Most of the error variations in GDP were explained by its own, agriculture and infrastructure expenditures. Education expenditure explained most of the GDP variations both in the short

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run and long run periods. Agriculture expenditure had average explanations for the GDP variations. Health and sports and culture had minimal explanations for GDP variations. The variations in GDP was greatly explained by education, its own, infrastructure, agriculture, health then finally sports and culture. Education expenditure explained averagely 60% of variations in the short run and over 70% in the long run.

CONCLUSION AND RECOMMENDATIONS

Overall, the analysis shows that on average public expenditure and potential economic growth are linked by a long-run relationship. The results suggest that, increased economic growth would differ quite considerably across sectors. In order to realize the expected economic growth in the country the performance will largely depends on the efficiency of scaled-up expenditure.

From the study, it is evident that the composition of government expenditure affects economic growth. It is however worth noting the key public expenditure components like education, agriculture and health were the major drivers of economic growth. This is based on the simple fact that Rwanda is a developing country and any investment in education leads to creation of required skilled human capital in industries which increases the GDP. Agriculture expenditure increases the total output of goods and services for domestic consumption and export. Health raises the productivity of people within the economy and even the savings increases too for a healthy economy thereby increasing the GDP. The possible explanation as to why public expenditure in infrastructure contributed negatively to economic growth in Rwanda is that Rwanda imported much labor in infrastructural development leading to high capital outflow.

The government should increase its expenditure allocation to the education sector. This is because the study found out that education expenditure affect economic growth positively. This positive effect can be maintained through continued provision of education facilities, training and employing more teachers, ensuring access to education to all citizens, reduction of the cost burden to the parents/guardian through offering fee guidelines to education institutions and expanding education to the marginalized groups through offering free and subsidized education. This is because quality education creates positive externalities and increases the productive capacity that helps to raise the steady state rate of economic growth.

The government should increase health expenditure as it increases the productivity of the citizens hence improving GDP. Agriculture expenditure should also be increased as it leads to increased total output as evidenced by the positive effects from the research findings. Expenditure on infrastructure should be streamlined. The government should embark on training more citizens on infrastructural development work to create more skilled manpower in this sector hence reducing the capital outflow resulting into a positive effect on GDP.

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