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The Effect of Components of Government Expenditure on Economic Growth Evidence From Ethiopia. (1980-2010)

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Abstract

This study examined the effect of components of government expenditure on economic growth of Ethiopia from 1980-2010 using ordinary least square (OLS), co-integration and Error correction mechanism. The unit root and co-integration test were conducted on the variables of interest. While error correction model were estimated. The results suggest that components of government expenditure have long run effect on economic growth. In addition to this the empirical results suggest that components of government expenditure such as expenditure on health, agriculture, education and transport and communication have a positive and significant effect on economic growth. While other components such as expenditure on defense and recurrent expenditure have a negative and significant effect on economic growth. The study therefore concludes that government expenditure on education, health, agriculture and transport and communication were growth –enhancing while government expenditure on defense and the recurrent expenditure were growth-retarding during the period under investigation. In addition to this the co-integration result indicates that there is a long run relationship between the variables.
Keyword: Economic growth, effect of components of government expenditure, co-integration.

1. Introduction

Governmental are usually the center of power, management & regulating the various matters that to achieve its goals to take some duties. Economists know that health and education are the most important tasks of governmental as their inherent duties & also they believe that the governmental intervention in the area of market failure & economic balance is necessary. But what is considered, it is that the governmental activities & how the influence of governmental expenditure always have been considered on economic growth & sometimes have been obtained different results. So this article is studied about the effects of Components of government expenditure on the economic growth of Ethiopia.

Economists are two different views about the role of government in economic activities. According to the neo-classical 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) .

The effect of government expenditure on economic growth is still an unresolved issue theoretically as well as empirically. However, there exist two approaches to public expenditure, Wagner's and Keynes approach. The Wagner's approach introduces a model that government expenditures are endogenous to economic development. While Keynes and his supporters, however, raise the thought that public expenditure is the real tool to boost the economic activities.

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 & Bratimasrene, 2007) and (Gregorious & Ghosh, 2007). There are some components of government expenditures that are productive while some are unproductive. Government expenditures on health and education raise the productivity of labour and increase the growth of national output. Education is one of the important factors that determine the quality of labour. Government expenditure on health could lead to economic growth in the sense that human capital is essential to growth. Good investment in the form of national defense is a necessity for safeguarding and protecting the nation from outside aggression, while agriculture, in the form of food security, is a necessity for human existence, 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.J, 1990).

However, some scholars did not support the claim that increasing government expenditure promotes economic growth, instead they assert that higher government expenditure may slowdown overall performance of the economy. For instance, in an attempt to finance rising expenditure, government may increase taxes and/or borrowing. Higher income tax discourages individual from working for long hours or even searching for jobs. This in turn reduces income and aggregate demand. In the same vein, higher profit tax tends to increase production costs and reduce investment expenditure as well as profitability of firms. Moreover, if government increases borrowing (especially from the banks) in order to finance its expenditure, it will compete (crowds-out) away the private sector, thus reducing private investment. Furthermore, in a bid to score cheap popularity and ensure that they continue to remain in power, politicians and governments officials sometimes increase expenditure and investment in unproductive projects or in goods that the private sector can produce more efficiently. Thus, government activity sometimes produces misallocation of resources and impedes the growth of national output. In fact, studies by (Barro & Sala-i-Martin, 1995)and (Benoit, 1978) suggested that large government expenditure has negative impact on economic growth.

1.1 Literature Review and Theoretical Frame work

This section discusses relevant literature and theoretical framework on the linkage between composition of government expenditure and economic growth. In the Keynesian model, increase in government expenditure (on infrastructures) leads to higher economic growth. Contrary to this view, the neo-classical growth models argue that government fiscal policy does not have any effect on the growth of national output. However, it has been argued that government fiscal policy helps to improve failure that might arise from the inefficiencies of the market. The seminal work of (Barro.J, 1990) opened new ground for the investigation of the impact of fiscal policy (government expenditure) on economic growth. In line with this, (Barro & Sala-i-Martin, 1992) and (Easterly & Rebelo, 1993) emphasized that government activity influences the direction of economic growth. Similarly, (Dar Atul & AmirKhalkhali, 2002) pointed out that in the endogenous growth models, fiscal policy is very crucial in predicting future economic growth.

Many researchers have attempted to examine the effect of government expenditure on economic growth. For instance, (Laudau D, 1983) examined the effect of government (consumption) expenditure on economic growth for a sample of 96 countries, and discovered a negative effect of government expenditure on growth of real output. (Korman & Bratimasrene, 2007) examined the association between government expenditures and economic growth in Thailand, by employing the Granger causality test. The results revealed that government expenditures and economic growth are not co-integrated. Moreover, the results indicated a unidirectional relationship, as causality runs from government expenditures to growth. Lastly, the results illustrated a significant positive effect of government spending on economic growth. (Olugbenga & Owoye, 2007), investigated the relationships between government expenditure and economic growth for a group of 30 OECD countries during the period 1970-2005. The regression results showed the existence of a long-run relationship between government expenditure and economic growth. In addition, the authors observed a unidirectional causality from government expenditure to growth for 16 out of the countries, thus supporting the Keynesian hypothesis. However, causality runs from economic growth to government expenditure in 10 out of the countries, confirming the Wagner's law.

(Kalio, 2000), examined the effect of different components of government expenditures on GDP growth using OLS method for a sample of time data (1970-1992) on Kenya. The study concluded that government expenditure on education, defense, and agriculture had a positive effect on GDP growth and that of health and transport and communication were negatively related to economic growth.

(Fan & Rao, 2003) ,analyzed the effect of different types of government expenditure on overall economic growth across 43 developing countries between 1980 and 1998 using OLS method and found mixed result. In Africa, government spending on agriculture and health was particularly strong on promoting economic growth. Among all types of government expenditures, agriculture, education, and defense contributed positively to GDP growth in Asia. In Latin America, health spending had a positive growth-promoting effect. Structural adjustment programs had a positive growth-promoting effect in Asia and Latin America, but not in Africa.

(Akpan, 2005), employed disaggregated approach in order to determine the components of government expenditure that stimulate GDP growth. The study concluded that there was no significant relationship between most components of government expenditure and economic growth in Nigeria. The empirical studies concerning the effect of government expenditure on defense have led to inconclusive results. Some studies argued that military spending has a negative effect on economic growth such as (Tomori & Adebiyi, 2002). However, others found a positive relationship between them (Diamond, 1989).

(Nurudeen & Abdullahi, 2010) Studying about the effect of military expenditure & economic growth in Nigeria in the years 2008-1970 then states that increasing of government expenditure has not led to growth and development of this country. Results indicate that total capital & current expenditure of government

& also expenditure on education has had a negative effect on growth & the increasing of expenditure on transportation& hygiene has led to economic growth. Also they have states that while government should increase the capital& current expenditure including education expenditure that financial resources for developing these sectors be completely management, in addition extend the investments on transportation.

(Chang, 2011)& others in their paper with this issue" Military expenditure and economic growth with using of GMM & Panel Data way of 90 countries in the period 1992-2006" they Studied on the possible causal relationship between military expenditure and economic growth. They divide these 90 countries based on classification of World Bank income to three groups of countries with high, middle & low income. Also divided countries based on geographical area to four groups: Africa, Europe and the South and East Asia and Oceanic region. They concluded that in countries with low income in significant level 10% of military expenditure leads to negative economic growth & Granger Causality has been negative in areas of Europe and East and South Asia.

(Mehrara & Musaei, 2011) ,in their article used of Granger Causality test for studying about the relationship of health expenditure & GDP for 11 oil countries with the using of Panel unit root test and correlation analysis. They used of 3variables model where the oil's incomes was used as a third variable. Results represent the strong relation of the oil incomes & the economic growth toward health expenditure in the oil countries, but health expenditure has not significant relationship on economic growth.

(Mohammadi, 2012), in a study with this subject "The impact of human capital on Iran's economic growth in 1960-2003" studied about the effect of improvement indicators of capital income on economic growth in Iran. They emphasized that the importance of investment on labor is not only less than economic plans even but also is one of the reasons for the failure of investment in the country is the neglecting of human capital's important role in the growth and development process.

So, different types of govrment expenditure may have a differential impact on economic growth in developing countries. As well as in developing countries. Emperical results in previous studies found posetive, negative, and mixed impacts of each componenets of government expenditure on econmic growth. Most researchers have analyzed the impact of total government expenditure for each sector of the economy , because of the un availablity of expense detail in each sector. However, this study separetely analyze each functional componenet of government expenbditure on economic growth.

2   Methodology

This paper uses the co-integration , ordinary least square and error correction methods to analyze the effect of components of government expenditure on economic growth. The framework for the study has its basis on the Keynesian and endogenous growth models. The Keynesian model states that expansion of government expenditure accelerates economic growth. Although, endogenous growth models do not assign any important role to government in the growth process, authors like (Barro.J, 1990) and (Barro & Sala-i-Martin, 1995) emphasized the importance of government (activity) policy in economic growth. Moreover, some authors focused on the components of government expenditure that are productive or unproductive (Kneller R, 1999) ,while   others submitted that composition of government expenditure might exert more influence compare to the level of government expenditure (Nijkamp P, 2004). From the foregoing discussion, the level of government expenditure and composition of government expenditure are important determinants of growth. Thus, our model expresses economic growth (GDPY) as a function of various levels and components of government expenditure that include total capital expenditure (TCEX), total recurrent expenditure (TRCEX), expenditures on defense (DEF), agriculture (AGR), transport and communication (TRACO), education (EDU) and health (HEA). In addition, we include inflation (IFN) since it can have lasting impact on economic growth.

Thus, the general form of the growth model is specified as;-

$$GDP = f(RCEX, CEX, DEF, AGR, TRACO, EDU, HEA, INF) \cdots\cdots\cdots\cdots\cdots (1)$$

Adopting this pattern therefore, the present study specifies the following models. This can be estimated

$$GDP = \beta_0 + \beta_1 rcex + \beta_2 cex + \beta_3 def + \beta_4 agr + \beta_5 traco + \beta_6 edu + \beta_7 hea + \beta_8 inf + U \cdots\cdots\cdots\cdots (2)$$

The variables are measured as follows. Economic growth refers to the changes in real GDP. Real GDP in turn is obtained by dividing GDP at current market price by the consumer price index (CPI). TRCEX is measured as total recurrent expenditure divided by the CPI. TCEX is captured by the total capital expenditure divided by the CPI. DEF is measured as government expenditure on defense divided by CPI. AGR is captured by government expenditure on agriculture divided by CPI. HEA is measured as government expenditure on health divided by CPI. EDU is captured by government expenditure on education divided by CPI. TRACO is measured as government expenditure on transport   and communication divided by CPI. While IFN is the inflation rate. U refers to the error term. The various expenditure items used are defined as payments for transactions within one year. Thus, we assumed the expenditure items to be actual expenditures. Prior to estimation of the growth model above, standard econometric tests like stationarity test and co-integration

test were conducted in order to avoid the generation of spurious regression results.

3. Empirical Result

3.1 Unit Root Test

In time series model, testing for the existence of unit roots test is a precondition for the study to investigate whether the variables are stationary or not. This is because macroeconomic data often appear to posses' stochastic trend that can be removed by differencing the variables. In addition to this it can help to avoid the generation of spurious regression results. Standard econometric test like co-integration test and stationarity (unit root) test is conducted. And the study employed the Augmented Dickey Fuller (ADF) to test the order of integration of both the dependent and independent variables. Based on this the unit root test results presented in table 1below shows that all the variables are stationary at level. The hypothesis of a unit roots was rejected at 5% significant level for each of the variable. Also from this table we can conclude based on Engle Granger cointegration approach that variable in the model co-integrate since the residual series obtained from the level regression in the model follow a I (0) process.(see table 1 below)

3.2 Co-integration Test

To check whether the variables are co-integrated or not, a Johansen Maximum Likelihood method is used to see the variables have stable long run linear relationship. In Johansen Maximum Likelihood method, the data used should be in the same order. Then these data are tested by both trace statistics and Max-Eigen statistics with 1% critical values. As shown in table 2 below, the co-integration result following the approach of Johansen and juselius (Johansen, 1998) two likely hood ratio test statics were utilized to determine the number of co-integrating equation in the model based on the assumption of no deterministic trend in the data. The result of the maximum Eigen value and trace test indicate that in both case the result showed that there is five co-integrating equation in the model as the test rejected the null hypothesis of no co-integration equation and accepted that of five co-integrating equation. (See table 2 below).

Table1 Unit root test result based on ADF Test

Variables	Augmented Dickey Fuller (ADF) test statistic	Critical values	Order of integration
GDP	2.695	1% level = -2.652 5% level= -1.950 10% level=-1.602	stationary at level
DEF	3.291	1% level = -2.652 5% level= -1.950 10% level=-1.602	stationary at level
AGR	4.516	1% level = -2.652 5% level= -1.950 10% level=-1.602	stationary at level
TRACO	13.086	1% level = -2.652 5% level= -1.950 10% level=-1.602	stationary at level
EDU	24.234	1% level = -2.652 5% level= -1.950 10% level=-1.602	stationary at level
HEA	8.894	1% level = -2.652 5% level= -1.950 10% level=-1.602	stationary at level
CEX	16.222	1% level = -2.652 5% level= -1.950 10% level=-1.602	stationary at level
RCEX	6.762	1% level = -2.652 5% level= -1.950 10% level=-1.602	stationary at level
INF	-2.140	1% level = -2.652 5% level= -1.950 10% level=-1.602	stationary at level
ECM	2.991	1% level = -2.652 5% level= -1.950 10% level=-1.602	stationary at level

Note that 5% significant level is used for the decision of the unit root.

Source; computed by using STATA.10

U=ECM is stationary at level this implying that the variables are co integrated. Their conintegration status is investigated first using the Engle- Granger cointegration test and it is found that their linear combination is stationary.

Table 2 Johansen Maximum Likelihood result of Trace & Max statics

Rank	Eigen value	Trace statics	1% critical value	Hypothesized no of CE(s)
R=0	0.99790	584.3208	204.95	None *
R=1	0.98564	405.5135	168.36	At most 1*
R=2	0.97561	282.4547	133.57	At most 2*
R=3	0.89581	174.7666	103.18	At most 3*
R=4	0.84285	109.1818	76.07	At most 4*
R=5	0.59851	55.5166	55.56	At most 5
R=6	0.44899	29.0520	35.65	At most 6
R=7	0.29868	11.7677	20.04	At most 7
R=8	0.04972	1.4789	6.65	At most 8

Trace test indicate 5 co-integrating equations at 0.01 level
* denotes rejection of the null hypothesis at the 0.01 level

Rank	Eigen value	Max –Eigen statics	1% critical value	Hypothesized no of CE(s)
R=0	0.99790	178.8070	362.80	None *
R=1	0.98564	123.0588	57.69	At most 1*
R=2	0.97561	107.6881	51.57	At most 2*
R=3	0.89581	65.5848	45.10	At most 3*
R=4	0.84285	53.6652	38.77	At most 4*
R=5	0.59851	26.4645	32.24	At most 5
R=6	0.44899	17.2843	25.52	At most 6
R=7	0.29868	10.2888	18.63	At most 7
R=8	0.04972	1.4789	6.65	At most 8

Max –Eigen vale test indicate 5 co-integrating equations at 0.01 level
* denotes rejection of the null hypothesis at the 0.01 level
Source; computed by using STATA.10

3.3 Regression Result

The estimation results reveal that the explanatory variables jointly account for approximately 98.11 percentage changes in economic growth. The Durbin Watson statistic (1.933) illustrates the absence of auto correlation. The estimation result shows that the variables agriculture (AGR), transport and communication (TRACO), education (EDU), health (HEA) and capital expenditure (CEX), Defense (DEF) and recurrent expenditure (RCEX) are statistically significant in explaining change in economic growth. However the variable inflation is not significant in explaining change in economic growth. For instance a 1 percentage increase in defense expenditure in the previous year causes economic growth to decline by -31.04 percentages. Similarly a 1 percent increase in total capital expenditure and recurrent expenditure in the previous year leads to an increase and decline in economic growth by 4.60 and -3.49 percentages respectively. Furthermore a 1 percentage increase of government expenditure on transport and communication in the previous year results to an increase in economic growth by approximately 41.34 percentages. Thus higher government expenditure on transport and communication creates an enabling environment for businesses to strive through reduced cost of production. Besides, the estimation shows that a 1 percent increase in government expenditure on education in the previous one year causes economic growth to increase approximately by 7.90 percentages. This variable with the reducing of illiteracy statistics, promoting of knowledge, education & the specialists person's education increased the production, technology & invention, consequently will increase the economic growth. Therefore, investment in the education sector will have positive and significant effect on economic growth. The other estimation result indicate that a 1 percent increase in expenditure on health in the previous one year leads to approximately 153.3 percentage increase in economic growth. Thus, increase in government expenditure on health raise the health status and productivity of the people, in addition to this an improvements in health programmes brings about an increase in the preference for smaller families, which, together with better provision of family planning services, helps to deal with the population problems in many developing countries. The same is expected to happen by switching spending from expensive curative health care systems to preventive systems and   there by promoting economic growth. Finally the estimation result of Agriculture indicate that a 1 percent increase in expenditure on Agriculture in the previous one year leads to approximately 21.66 percentage increase in economic growth. This is because that the economy of the country heavily relying on agriculture and the sector is the back bone of the country economy and underpin inclusive growth.

Table 3 Regression Result
Dependent variable GDP
Method ordinary Least square

Variable	Coefficients	Std.error	t-statics	probability
Def	-31.04174	20516.96	-2.15	0.043
Agr	21.66171	9.142674	2.37	0.027
Traco	41.34536	10.88873	3.80	0.001
Edu	7.908496	12.6715	0.62	0.039
Hea	153.3239	24.01944	6.38	0.000
Cex	4.606972	4.47562	-1.03	0.015
Rcex	-3.492437	2.041947	-1.71	0.101
Inf	507.4857	415.8969	1.22	0.235
_cons	20516.96	8936.208	2.30	0.032

R-squared   = 0.9811   Durbin-Watson d-statistic 1.933783

Adj R-squared = 0.9742   Prob (F statics)   = 0.0000

4. Conclusion

This study investigated the effect of components of government expenditure on economic growth of Ethiopia using time series data from 1980-2010 by employing the Ordinary Least squares (OLS) and using co-integrated error correction method. Accordingly, the empirical results of various components of   government expenditure have a positive and negative effect on the economic growth of Ethiopia. For instance government expenditure on Agriculture, Health, Transport and communication, Education and capital expenditure has a positive and significant effect on economic growth. Government expenditure on health provides the biggest effect on economic growth when compared to other components of government expenditure. Furthermore components of Government expenditure on Defense and Recurrent expenditure have a negative and significant effect on economic growth of Ethiopia.

4.1 Policy Implications

Government size is positively associated with economic growth, while government expenditure provides the biggest impact. Increasing government expenditure in a growth context seems to be improving productivity. Accordingly, policy makers should consider improving the productivity of private investment by creating a supportive infrastructure environment, competitive trade policy, and tax incentives for existing and potential investors. Further, export promotion activity should be implemented to promote the economic growth.

Empirical results of this study indicate that various components of government expenditure provide different effect on economic growth. Therefore, the efficiency of government expenditure can be improved by reallocating funds among sectors. In order to improve the productivity and promote economic growth, the government should increase its consumption expenditure on the Agriculture, Health, and welfare sector and investment expenditure on Education, Health, Agriculture and Transport and communication.

4.2 Suggestions for Future study

This study is limited to Ethiopia, but it is important to compare the effect of componenets of government expenditure on economic growth in developing countries, or in sub saharan african countries to determine policy direction for future economic activities in the region .There fore, it is suggested a similar study to be conducted for the sub saharan african countries. Further more, this study analyzed the effect of componenets of government expenditure on economic growth of Ethiopia with few macroeconomic variables, but there are many macroeconomic and poletical variables ,which can influence economic growth and government expenditure in any country. Hence, it is also recommended that future studies add relevant macroeconomic and poletical variables.

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