Composition of Government Expenditure and Economic Growth in Ethiopia (1975-2011G.C)

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Abstract
The aim of this quantitative study is to analyze the compositions of public expenditure with economic growth in Ethiopia. The focuses of this paper is to examine which composition of public expenditure promoting economic growth in Ethiopia. Public expenditure data was collected from 1975-2011G.C. Regression analysis is applied to the composition of public expenditure on economic growth. The study found that the independent variables (agri, he, rtac, trind,) altogether accounted 97 % changes in economic growth. On the other hand, considering the composition of public expenditure, on agriculture, health, trade and industry are statistically significant in explaining changes in economic growth. However, expenditure on road transport and communication is statically insignificant in explaining economic growth in Ethiopia. The study recommended that the government should increase efficiency of the financial resource by scrutinizing and evaluating for spending in transport and communication to create new capacity and support existing capacities. In addition, government should strengthen three principal-agent relationship dimensions(C=M+D – A) of the organizational structure that is crucial in decreasing the opportunity for corruption in government spending. From the social change perspective, if the government put into practice the suggested solutions as inputs for future policy formulation and successful execution of public expenditure, the wellbeing of the public will be enhanced. Ethiopians will experience significant improvements in growth and development, standard of livings and increase in employment.

Keywords: Composition of public expenditure, economic growth, co-integration, unit root test.

1.0. Introduction
The most important purpose of development within Ethiopia is to eliminate poverty in the coming twenty years period of time. This can be accomplished by implementing broad-based development policies that would not only enhance economic growth, but would also remain to the principles of fair distribution of the benefits from such growth.1

Government expenditure is one of the crucial factors that find the level of economic growth of a country. However, Basudev (2012) confirmed the growth of economy depends on the size, spending capacity, Composition and effective use of public expenditure in the economic growth process. Although the quality of public expenditure matters, increasing large amount of expenditure by the government may not necessarily create a successful result in economic growth. Such expenditure should be provided with the right public expenditure management and control in order to achieve economic growth and improve the standard of living of the population (Leonardo, 2011).

Using public expenditure in escalating economic growth and enhancing the life of the population, Ethiopia sat down medium and long-term visions.2 Currently the Ethiopian government is investing in various infrastructures like the renaissance dam, railway, building of condominiums and various roads to accelerate the growth and development of the country. Public expenditure represents one of the most important components of the fiscal policy instruments for achieving various goals of governments. One of the aims of government is economic growth. It is expected when public expenditure used for investment in capital asset at the early stages of economic growth.

Currently, it is important to study that examining the composition of government spending affects economic growth in Ethiopia. Even if there is marvelous growth in the literature on public expenditure and economic growth, there are several gaps. There is no universal agreement on which composition of the expenditure has direct effect on economic growth. Therefore, the objective of this paper is to analyze the compositions of public expenditure to the growth of the Ethiopian economy. This will provide important information for the usages of limited public financial resources. The rest of this article is structured as follows: Following section one is section two, which discusses with Literature review. Section three deals Specification and Estimation of the Model. Empirical results are discussed in section four. Finally Section five concludes and suggests policy recommendation of this article.

2 ibid
2.0. Literature Review
When we see empirical studies on the relationship between the composition of public expenditure and economic growth, most results are still mixed. There is no universal agreement on which compositions of public expenditure directly promote economic growth.

The following researchers have studied the link between public expenditure on economic growth. Teshome (2006) examined the impact of public expenditure on economic growth in Ethiopia for the period 1960/61-2003/04. He applied econometric techniques of using Johanson Maximum Likelihood Estimation procedure to check the relationships of different sectors of public expenditure on the growth of real GDP. He found that only spending on human capital has long-run significant positive impact. However, productive public spending showed negative and insignificant impact on the growth of real growth domestic product; it is also clear regarding that there exist inefficiency and poor quality of public expenditure. The authors found that in the short run, all components of public spending do not have significant meaning in explaining economic growth.

Niloy et al. (2007) also examined the growth effects of public expenditure focused on disaggregated public spending for a panel of 30 developing countries between 1970s and 1980s. They found that the share of government capital expenditure in GDP is positively and significantly correlated with economic growth, but current expenditure is insignificant. In disaggregated level, government expenditure in education and total expenditures in education are the only spending that is significantly associated with growth. In support of the above, John (2012) using data from 1972 to 2008 for Kenya, investigated the effect of the components of public spending on economic growth. The author concluded that spending on education was a highly significant determinant of economic growth. However, spending on transport and communication, economic affairs, were also weakly significant to economic growth. Conversely, spending on agriculture was negatively significant on economic growth and spending on health is insignificant determinants of economic growth.

Abu and Abdullahi (2010) using data from the period 1970-to 2008 investigated the effect of government expenditure on economic growth in Nigeria. He discovered that expenditure on education, total recurrent expenditures and total capital have a negative effect on economic growth. However, rising public spending on health, transport and communication will enhance in economic growth. In addition to the above, Adewara and Oloni (2012) empirically investigated the components of government spending and economic growth in Nigeria with the period from 1960 to 2008 using the vector Autoregressive models (VAR). They concluded that government spending on agriculture, health and transport are positive and significantly related to economic growth. However, spending on education is both negative and not significantly to economic growth.

Tajudeen and Ismail (2013) studied using annual time series data from the period from 1970 to 2010 in Nigeria concerning that the impact of government spending on economic growth. They used the bounds testing Auto-Regressive Distributed Lag (ARDL) approach to analyze the long run and short run relationships between government spending and economic growth. They found that total government spending has negative impact on economic growth. However, recurrent expenditure has little significant positive impact on economic growth. The relationship between spending on education and economic growth was negative and insignificant. The impact of education, though also negative was not significant.

3.0. Specification and Estimation of The Model
Following the classification made by the IMF, two ways of dis-aggregating public spending is generally accepted. The first one is the distinction between capital expenditure and current spending. The second one is the so-called “functional classification,” which distinguishes categories according to their last use such as: (agriculture, industry, health, etc.). Therefore, this model followed the functional classification of public expenditure.

The following growth model was adapted from Abu (2010) equation to test the various expenditure components in the case of Ethiopia.

\[
\text{Rgdp}= f\left(\text{agri}, \text{educ}, \text{he}, \text{rtac}, \text{trind}, r\right) \quad (1)
\]

Where: Rgdp means real gross domestic product
“agri” means expenditure on agriculture
“educ” means expenditure on education
“he” means expenditure on health
“rtac” means expenditure on road transport and communication
“trind” means expenditure on trade and industry
“r” means rainfall data as control variable
As mentioned above, the equation was converted into econometrics format and the result is indicated below:

\[ R_{gd} = \beta_0 + \beta_1 \text{agri} + \beta_2 \text{rtac} + \beta_3 \text{educ} + \beta_4 \text{he} + \beta_5 \text{trind} + \beta_6 r + u_1 \quad (2) \]

So, the equation above equation can be transformed into to log-log model and it becomes;

\[ \ln R_{gd} = \beta_0 + \beta_1 \ln \text{agri} + \beta_2 \ln \text{rtac} + \beta_3 \ln \text{educ} + \beta_4 \ln \text{he} + \beta_5 \ln \text{trind} + \beta_6 \ln r + u_1 \quad (3) \]

\( \beta_1, \beta_2, \beta_3, \beta_4, \beta_5 \) and \( \beta_6 \) are coefficients of semi-elasticities (slopes) of agri, rtac, educ, he, trind and r respectively. While \( u_1 \) corresponds to error term, it means other variables that could have effects on further explanations for the dependent variable of \( R_{gd} \) but, are not included in this model. The sign of each coefficient is dependent upon the relative contributions of the related independent variables that will be depending on the performance of the economic system under consideration.

### 3.1. Define the Research Variables

The dependent variable is the economic growth in real GDP. The explanatory (independent) variables are various levels and components of government expenditure. For the purpose of this study, government expenditure denotes country wide budgetary expenditure, including the federal government, regional and local governments.

The level of government expenditure and composition of government expenditure are important determinants of growth.

The variables are measured as follows:

1. Economic growth refers to the changes in real GDP.
2. Real GDP in turn is obtained by dividing GDP at current market price by the consumer price index (CPI).
3. E\text{agri} is captured by government expenditure on agriculture divided by CPI.
4. R\text{tac} is measured as government expenditure on the road transport and communication divided by CPI.
5. Educ \text{Eexp} is captured by government expenditure on education divided by CPI.
6. H\text{exp} is measured as government expenditure on health divided by CPI.
7. Tr\text{ind} is measured as government expenditure on trade and industry divided by CPI.
8. R is measured in milliliter.
9. U refers to the error term. Prior to estimation of the growth model above, standard econometrics pre-tests and post-tests are conducted to avoid the generation of spurious regression results.\(^1\)

### 3.2. Sources of Data

This paper used Ethiopian data that covered from the period 1975-2011. The data is primarily collected from The Ethiopian Ministry of Finance and Economic Development (MOFED) and the various Federal and Regional Bureaus.

### 4.0. Empirical Result

Using E-views program as a tool, this paper analyzed the secondary data between 1975-2011E.C. empirical results and discussions are illustrated in the following manner.

#### 4.1. Stationarity (Unit root) Test

In the time series econometrics model, Testing for the existence of unit roots is a precondition for the study. In order to avoid the generation of spurious (nonsense) regression results, Standard econometric tests like co-integration test and stationarity (unit root) test was conducted. The study employed the Augmented Dickey Fuller (ADF) to test the order of integration of both the dependent and independent variables. The unit root test results are presented in Table 8. As it is revealed in the Table below, all dependent and independent variables are stationary at their first difference. However, error term is stationary at level.

In order to test stationarity using this method, there should be a standard way of writing the null hypothesis (H\text{0}) and the alternative hypothesis (H\text{1}) as follows.

- \( H_0 \): each time series contains a unit root
- \( H_1 \): each time series is stationary

\(^1\) ibid
### Table 1

#### Unit Root Test Results Based on ADF Test

<table>
<thead>
<tr>
<th>Variable</th>
<th>Augmented Dickey-Fuller Test Statistic</th>
<th>Dickey-Fuller Level (%)</th>
<th>Critical Values</th>
<th>Order of Integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>LRGDP</td>
<td>-7.819037 (0.0000)</td>
<td>1</td>
<td>-4.243644</td>
<td>Stationary at first differences</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5</td>
<td>-3.540328</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10</td>
<td>-3.204699</td>
<td></td>
</tr>
<tr>
<td>LAGRI</td>
<td>-7.438114 (0.0000)</td>
<td>1</td>
<td>-4.243644</td>
<td>Stationary at first differences</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5</td>
<td>-3.544284</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10</td>
<td>-3.204699</td>
<td></td>
</tr>
<tr>
<td>LEDUC</td>
<td>-5.322539 (0.0006)</td>
<td>1</td>
<td>-4.243644</td>
<td>Stationary at first differences</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5</td>
<td>-3.544284</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10</td>
<td>-3.204699</td>
<td></td>
</tr>
<tr>
<td>LHE</td>
<td>-7.068958 (0.0036)</td>
<td>1</td>
<td>-4.252879</td>
<td>Stationary at first differences</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5</td>
<td>-3.548490</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10</td>
<td>-3.207094</td>
<td></td>
</tr>
<tr>
<td>LRTAC</td>
<td>-7.188388 (0.0000)</td>
<td>1</td>
<td>-4.243644</td>
<td>Stationary at first differences</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5</td>
<td>-3.544284</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10</td>
<td>-3.204699</td>
<td></td>
</tr>
<tr>
<td>LTRIND</td>
<td>-5.620883 (0.0003)</td>
<td>1</td>
<td>-4.243644</td>
<td>Stationary at first differences</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5</td>
<td>-3.544284</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10</td>
<td>-3.204699</td>
<td></td>
</tr>
<tr>
<td>LR</td>
<td>0.0049 (-4.527507)</td>
<td>1</td>
<td>4.243644</td>
<td>Stationary at first differences</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5</td>
<td>3.544284</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10</td>
<td>3.204699</td>
<td></td>
</tr>
<tr>
<td>U</td>
<td>-5.444853 (0.0004)</td>
<td>1</td>
<td>-4.234972</td>
<td>Stationary at level</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5</td>
<td>-3.540328</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10</td>
<td>-3.202445</td>
<td></td>
</tr>
</tbody>
</table>

Source: Computed by Using E-views

Note: 5% significance level is used for the decision of Unit root. U (Error term) is stationary at a level implying that the variables are Co-integrated.

The Engle-Granger method requires all the variables in equation (1) to be integrated of order one, I (1) and the error term is integrated to be order of zero, I (0) for establishing a co-integration relationship (Roberto and Ferda, 2009).

### 4.2. Co-integration Test

To check whether the variables are co-integrated or not, a Johansen maximum likelihood method was 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 was tested by both trace statistics and Max-Eigen statistics with 5% critical value. As shown in Table 2a and 2b, both r
Unrestricted co-integration Rank Test (Trace)
Sample (adjusted): 1977 2011
Included observations: 35 after adjustments
Trend assumption: Linear deterministic trend
Series: : LRGDP LAGRI LRTAC LEDUC LHE LTRIND LR
Lags interval (in first differences): 1 to 1

<table>
<thead>
<tr>
<th>Hypothesized No. of CE(s)</th>
<th>Eigen Value</th>
<th>Trace Statistic</th>
<th>0.05 Critical Value</th>
<th>Prob.**</th>
</tr>
</thead>
<tbody>
<tr>
<td>None *</td>
<td>0.816549</td>
<td>149.3174</td>
<td>125.6154</td>
<td>0.0008</td>
</tr>
<tr>
<td>At most 1</td>
<td>0.703403</td>
<td>89.96407</td>
<td>95.75366</td>
<td>0.1171</td>
</tr>
<tr>
<td>At most 2</td>
<td>0.423957</td>
<td>47.42577</td>
<td>69.81889</td>
<td>0.7446</td>
</tr>
<tr>
<td>At most 3</td>
<td>0.323194</td>
<td>28.12073</td>
<td>47.85613</td>
<td>0.8084</td>
</tr>
<tr>
<td>At most 4</td>
<td>0.195044</td>
<td>14.45777</td>
<td>29.79707</td>
<td>0.8140</td>
</tr>
<tr>
<td>At most 5</td>
<td>0.140854</td>
<td>6.863889</td>
<td>15.49471</td>
<td>0.5935</td>
</tr>
<tr>
<td>At most 6</td>
<td>0.043328</td>
<td>1.550301</td>
<td>3.841466</td>
<td>0.2131</td>
</tr>
</tbody>
</table>

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

Table 2b
Co integration Result: Unrestricted co-integration Rank Test (Maximum Eigen Value)

<table>
<thead>
<tr>
<th>Hypothesized No. of CE(s)</th>
<th>Eigen value</th>
<th>Max-Eigen Statistic</th>
<th>0.05 Critical Value</th>
<th>Prob.**</th>
</tr>
</thead>
<tbody>
<tr>
<td>None *</td>
<td>0.816549</td>
<td>59.35331</td>
<td>46.23142</td>
<td>0.0012</td>
</tr>
<tr>
<td>At most 1</td>
<td>0.703403</td>
<td>42.53830</td>
<td>40.07757</td>
<td>0.0259</td>
</tr>
<tr>
<td>At most 2</td>
<td>0.423957</td>
<td>19.30505</td>
<td>33.87687</td>
<td>0.8029</td>
</tr>
<tr>
<td>At most 3</td>
<td>0.323194</td>
<td>13.66296</td>
<td>27.58434</td>
<td>0.8452</td>
</tr>
<tr>
<td>At most 4</td>
<td>0.195044</td>
<td>7.593880</td>
<td>21.13162</td>
<td>0.9268</td>
</tr>
<tr>
<td>At most 5</td>
<td>0.140854</td>
<td>5.313588</td>
<td>14.26460</td>
<td>0.7018</td>
</tr>
<tr>
<td>At most 6</td>
<td>0.043328</td>
<td>1.550301</td>
<td>3.841466</td>
<td>0.2131</td>
</tr>
</tbody>
</table>

Max-eigen value 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
Source: Computed by Using E-views

4.3. Model Estimation
After pre-estimation is conducted, the researcher estimated the model by using least square method and results are indicated in the following Table.

Table 3 Result of Least square
Dependent Variable: D(LRGDP)
Method: Least Squares
Sample: 1975 2011

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>9.653987</td>
<td>0.347422</td>
<td>27.78750</td>
<td>0.0000</td>
</tr>
<tr>
<td>DLAGRI</td>
<td>0.038579</td>
<td>0.063849</td>
<td>0.604219</td>
<td>0.5502</td>
</tr>
<tr>
<td>DLEDUC</td>
<td>0.382629</td>
<td>0.116091</td>
<td>3.295935</td>
<td>0.0025</td>
</tr>
<tr>
<td>DLHE</td>
<td>0.486321</td>
<td>0.114974</td>
<td>4.229833</td>
<td>0.0002</td>
</tr>
<tr>
<td>DLRTAC</td>
<td>-0.065468</td>
<td>0.066179</td>
<td>-0.989256</td>
<td>0.3304</td>
</tr>
<tr>
<td>DLTRIND</td>
<td>-0.065772</td>
<td>0.022631</td>
<td>-2.906294</td>
<td>0.0068</td>
</tr>
<tr>
<td>DLR</td>
<td>0.012193</td>
<td>0.023829</td>
<td>0.511668</td>
<td>0.6126</td>
</tr>
</tbody>
</table>

R-squared | 0.978639 | Mean dependent var | 11.11065|
Adjusted R-squared | 0.974367 | S.D. dependent var | 0.584060|
S.E. of regression | 0.093510 | Akaike info criterion | -1.732836|
Sum squared resid | 0.262324 | Schwarz criterion | -1.420686|
Log likelihood | 39.05747 | Hannan-Quinn criter. | -1.625391|
F-statistic | 229.0718 | Durbin-Watson stat | 1.918717|
Prob(F-statistic) | 0.000000 |

Source: Computed by Using E-views
To decide whether the above estimation result is acceptable or not, the researcher used post estimation techniques in the following ways.

**Post Estimation**  

**Normality Test Using Residual**  
In the following Figure 1, the residual test indicated that the JB value is 2.64 with a \( p \) value of 0.266. Therefore, the \( p \) value greater than 5% implied that \( H_0 \) should not be rejected. Therefore, the dependent variable (DLRGDP) follows the assumption of normality.

![Figure 1. Normality Test Results for Residual](image)

Source: Own Computation Using Eviews

**Auto correlation (Serial Correlation)**  
There are different tests for checking the assumption of auto correlation. In this thesis, the researcher used Breusch-Godfrey Serial Correlation LM Test. For checking auto correlation, the standard way of writing the null and alternative hypothesis is as follows.

\[
H_0 = \text{There is no Auto correlation} \\
H_1 = \text{There is Auto correlation}
\]

Eviews result for auto correlation is indicated in Table 11 below.

| Table 4  
Result of Breusch-Godfrey Serial Correlation LM Test: |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>F-statistic</td>
<td>0.177237</td>
<td>Prob. ( F(2,28) )</td>
</tr>
<tr>
<td>Obs*R-squared</td>
<td>0.462556</td>
<td>Prob. Chi-Square(2)</td>
</tr>
</tbody>
</table>

Source: Own Computation Using Eviews

The above result (Table 4) revealed that there is no auto correlation in this model. The corresponding probability of the Obs\*R-squared value (0.7935) is greater than 5%. Therefore, the Obs\*R-squared value greater than 5% implied that \( H_0 \) should not be rejected. Hence, the model is free from auto correlation.

**Heteroskedasticity Test: Breusch-Pagan-Godfrey**  
For checking heteroskedasticity test, the standard way of writing the null and alternative hypothesis is as follows.

\[
H_0 = \text{there is no heteroskedasticity} \\
H_1 = \text{there is heteroskedasticity}
\]

Eviews result from heteroskedasticity test result is indicted in the next Table.
Table 5
Result of Heteroskedasticity Test: Breusch-Pagan-Godfrey

<table>
<thead>
<tr>
<th></th>
<th>F-statistic</th>
<th>Prob. F(6,30)</th>
<th>Obs*R-squared</th>
<th>Prob. Chi-Square(6)</th>
<th>Scaled explained SS</th>
<th>Prob. Chi-Square(6)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.685598</td>
<td>0.1589</td>
<td>9.328579</td>
<td>0.1559</td>
<td>6.232221</td>
<td>0.3977</td>
</tr>
</tbody>
</table>

Source: Own Computation Using Eviews
The above result (Table 5) revealed that there is no heteroskedasticity problem with this model. Because, the corresponding probability of the Obs*R-squared value (0.1559) is greater than 5%. Therefore, the Obs*R-squared value greater than 5% implied that the null hypothesis should not be rejected. Hence, the model is free from heteroskedasticity.

**Multicollinearity Test**
Multicollinearity may exist when there is a high correlation between any two independent variables. A problem of Multicollinearity makes significant variables insignificant by increasing its standard error. When the standard error goes up, t-value will go down and hence resulted in, high \( p \)-value. That is the variable becomes insignificant.

Multicollinearity can be detected by using correlation analysis of only independent variables. The result of correlation analysis of the model is revealed in the following Table.

Table 6
Results of Multicollinearity Test

<table>
<thead>
<tr>
<th>DLAGRI</th>
<th>DLEDUC</th>
<th>DLHE</th>
<th>DLRTAC</th>
<th>DLTRIND</th>
<th>DLR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.000000</td>
<td>0.919938</td>
<td>0.882705</td>
<td>0.860387</td>
<td>0.383504</td>
<td>0.405159</td>
</tr>
<tr>
<td>0.919938</td>
<td>1.000000</td>
<td>0.974166</td>
<td>0.956474</td>
<td>0.384202</td>
<td>0.516342</td>
</tr>
<tr>
<td>0.882705</td>
<td>0.974166</td>
<td>1.000000</td>
<td>0.957837</td>
<td>0.356267</td>
<td>0.544308</td>
</tr>
<tr>
<td>0.860387</td>
<td>0.956474</td>
<td>0.957837</td>
<td>1.000000</td>
<td>0.234842</td>
<td>0.504739</td>
</tr>
<tr>
<td>0.383504</td>
<td>0.384202</td>
<td>0.356267</td>
<td>0.234842</td>
<td>1.000000</td>
<td>0.359125</td>
</tr>
<tr>
<td>0.405159</td>
<td>0.516342</td>
<td>0.544308</td>
<td>0.504739</td>
<td>0.359125</td>
<td>1.000000</td>
</tr>
</tbody>
</table>

Source: Authors Computation Using Eviews
There are two steps for detecting problems of multicollinearity. The first step is selecting the variables which have higher correlation between two variables. The second step is comparing their \( p \)-value and selects the variable which has high \( p \)-value. In this model, the two variables having highest correlation are between education and health (LEDUC and LHE). In comparing their \( p \)-value, LEDUC has high \( p \) (0.0025) value in comparing the EDUC \( p \) (0.0002) value. Therefore, LEDUC is dropped. And the researcher again runs the model. After dropping LEDUC, The new model is revealed in Table 6 below.

**Model specification test (Ramsey RESET Test)**
For checking Model specification test (Ramsey RESET Test), the standard way of writing the null and alternative hypothesis is as follows.

\[ H_0 = \text{the model correctly specified} \]
\[ H_1 = \text{the model is not correctly specified} \]

The following Table 7 revealed that the model is correctly specified. It is also possible to check with a \( p \) value of 42%. Therefore, the \( p \) value greater than 5% implied that \( H_0 \) should not be rejected. Therefore, the model is correctly specified.

Table 7
Results of Ramsey Reset Test:

<table>
<thead>
<tr>
<th></th>
<th>F-statistic</th>
<th>Prob. F (1,29)</th>
<th>Log likelihood ratio</th>
<th>Prob. Chi-Square (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.509301</td>
<td>0.4811</td>
<td>0.644158</td>
<td>0.4222</td>
</tr>
</tbody>
</table>

Source: Authors Computation Using Eviews.

**Stability Checks**
In order to check the stability of the dependent variable DLRGDP, the two marginal lines were observed. If the blue line is in between the red line, we call that the dependent variable is stable. Therefore, Figure 2 showed that the dependent variable DLRGDP is stable since the blue line is within the red line.


Figure 2 Stability Test Result
Source: Own Computation Using E-views

Model Estimation
After checking all diagnostic tests, the final model is estimated here and indicated in Table 15.

Table 8
Results of final model estimation
Dependent Variable: DLRGDP
Method: Least Squares
Sample: 1975 2011
Included observations: 37

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>9.296334</td>
<td>0.378925</td>
<td>24.53346</td>
<td>0.0000</td>
</tr>
<tr>
<td>DLAGRI</td>
<td>0.148608</td>
<td>0.062487</td>
<td>2.378210</td>
<td>0.0237</td>
</tr>
<tr>
<td>DLHE</td>
<td>0.689832</td>
<td>0.111352</td>
<td>6.195063</td>
<td>0.0000</td>
</tr>
<tr>
<td>DLRTAC</td>
<td>0.033355</td>
<td>0.067735</td>
<td>0.492435</td>
<td>0.6259</td>
</tr>
<tr>
<td>DLTRIND</td>
<td>-0.043257</td>
<td>0.024771</td>
<td>-1.746275</td>
<td>0.0907</td>
</tr>
<tr>
<td>DLR</td>
<td>0.011152</td>
<td>0.027357</td>
<td>0.407644</td>
<td>0.6863</td>
</tr>
<tr>
<td>U(-1)</td>
<td>-0.866351</td>
<td>0.210227</td>
<td>-4.121030</td>
<td>0.0003</td>
</tr>
</tbody>
</table>

R-squared 0.970904  Mean dependent var 11.11065
Adjusted R-squared 0.966211  S.D. dependent var 0.584060
S.E. of regression 0.0357314  Akaike info criterion -1.477858
Sum squared resid 33.34037  Schwarz criterion -1.216628
Log likelihood 206.8884  Hannan-Quinn criter. -1.385762
F-statistic 206.8884  Durbin-Watson stat 1.980434
Prob(F-statistic) 0.000000

Source: Authors Computation Using E-views

4.4. Regression Results
As indicated in Table 8, all diagnostic tests proved that the model is acceptable and $R^2$ is also greater than 60%. The Durbin Watson statistic is 1.98 which is close to the usual suggested value of 2.0 which indicated that it is free from auto-correlation among the variables in the model. The ECM is also negative and significant. Therefore, at the rate of 86 percent of speed at which the dependent variable - DLRGDP - returns to equilibrium after a change in an independent variables annually. The $p$-value of F statistic indicated that Independent variables (compositions of expenditure) are jointly significant to explain the economic growth (real DLRGDP). The result of the Least Squares showed that independent variables all together accounted 97 % change in economic growth. On the other hand, considering the compositions of public expenditure on agriculture, health, trade and industry are statistically significant in explaining changes in economic growth. For example, if expenditure on agriculture increases by 1 % we expect economic growth to increase by 0.15 %. If expenditure on health increases by 1 %, we expect economic growth to increase by 0.69 %. However, expenditure on road
transport and communication is statically insignificant

5.0. Conclusion and Policy Recommendation

The objective of the study was to: Analyze composition of public expenditure that promotes economic growth in Ethiopia. Using government expenditure as a tool to boost economic growth and enhance the life of the population, Ethiopia has set down both medium and long-term plans. The growth of the economy is essential for sustainable development. Without economic growth, it will be difficult for developing country like Ethiopia to enhance the standard of living for the population. Therefore, this paper investigated the relationship between Economic growth and various compositions of Public expenditures by using co-integrated error correction modeling from the period 1975-2011G.C.

Therefore, the result indicated that independent variables all together accounted 97 % change in economic growth. On the other hand, considering the compositions of public expenditure on agriculture, health, trade and industry are statistically significant in explaining changes in economic growth. For example, if expenditure on agriculture increases by 1 % we expect economic growth to increase by 0.15 %. If expenditure on health increases by 1 %, we expect economic growth to increase by 0.69 %. However, expenditure on road transport and communication is statically insignificant.

Based on the above findings, this paper suggests the following recommendation. The study recommended that the government should increase efficiency of the financial resource by scrutinizing and evaluating for spending in transport and communication to create new capacity and support existing capacities. In addition, government should strengthen three principal-agent relationship dimensions(C=M+D – A) of the organizational structure that is crucial in decreasing the opportunity for corruption in government spending. From the social change perspective, if the government put into practice the suggested solutions as inputs for future policy formulation and successful execution of public expenditure, the wellbeing of the public will be enhanced. Ethiopians will experience significant improvements in growth and development, standard of livings and increase in employment.

References


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