Determinants of Economic Growth of Ethiopia: An Analysis for the Post Ethiopia-Eretria War (1998-2000)

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ABSTRACT

The purpose of this paper is to investigate what major macroeconomic variables contributed for the economic growth of Ethiopia after the Ethiopia-Eritrea war of 1998-2000.

This study applies ordinary least square on time series data pertaining to core macroeconomics variables, collected from the database of World Bank and IMF. Empirical results reveal that Ethiopia has experienced economic boom after the Ethiopia-Eritrea war of 1998-2000 with its strategy of curtailing government expenditure and expanding public investment on mega projects. The study also identified that the "peace dividends" found to be well placed and is paying back positively. Ethiopia witnessed transition towards emerging economy in Sub-Saharan African country, assessing the economic growth and the factors that interplay behind the growth may give helpful lesson for similar economies and the region.

In contrast with other existing economic booms, Ethiopia's growth acceleration has not achieved much attention in the literature. This study fills the gap by methodically identifying and assessing the major economic driving forces after the Ethiopia-Eritrea war of 1998-2000. The time period indicates crucial detours of how the country initiated and maintained the economic boom.

Keywords: *Economic growth, Structural change, GDP, Investment, government expenditures*

Introduction

Now a day's economic growth and sustainable development issues have come to be an agenda for dialogue and debates among scholars of different fields. Different principles and

socioeconomic theories have risen and fallen over a course of time. Growth has accelerated in a wide range of developing countries over the last couple of decades, resulting in an extraordinary period of convergence with the advanced economies (Rodrik, 2017). The main features of the economic growth of nations are described by the stylized facts (Islam et al., 2003). The original stylized facts of growth focuses on a number of ''grand'' ratios and their evolution through time, specifically: potential output and per-capita income growth over the long run; capital stock growth is about the same as output; the rate of capital labor ratio growth, the distribution of income, the level of life standards are some among the many (Jalali-Naini, 2006).

From 1980-90 various cross-sectional studies in developing countries have indicated the provision of sound economic policy interventions to promote economic growth and prosperity through providing enabling economic environments for private and public sector investments. Evidence suggests that good macroeconomic management is associated with faster economic growth for a given rate of investment (Bleaney, 1996). In relation to these, Ethiopia has gone through numerous political economy changes in the past eight decades ranging from monarchical to parliamentary democratic regimes with distinct and diverse economic policy and strategies. Starting from 1992, the new government of Ethiopian has implemented economic reform program with a view of reviving the economy of the country that had suffered from many years of civil wars, food security crisis, heavy central planning (IMF, 1999; Geda, 2006; Shiferaw, 2017). Hence, Ethiopia is being enjoying stunning, high economic growth since 2003, and now nearly for two decades. The "growth acceleration" is unique compared with the Sub Saharan African countries (SSA) and also in international comparison because of two reasons. Firstly, the country only had meager per-capita growth before 2003 in the period 1992-2003 (Geda, 2006; Priewe, 2016). Secondly and Above all, what makes this economic leap more surprising is the unorthodox strategies which are hardly comparative with the Western economic strategies and also it occurred in one of the poorest countries in the world. Furthermore, policy makers and officials has reported that the growth brought strong improvements in key developmental indicators like poverty reduction, life expectancy etc. (Priewe, 2016)**.**

The nation first, with the Agricultural Development Leads to Industrialization Plan (ADLI) and then afterwards with the Growth and Transformation Plan I (GTP I) and Growth and Transformation Plan (GTP II), is registering dramatic economic growth at an average rate of 10.8% per annum. This stands out as one of the fastest growing economies in the world (Admit *et al.*, 2016; Priewe, 2016; Moller and Wacker, 2017). In 2014/15, real GDP grew by 10.2%, keeping the momentum of the 10.3% growth rate of 2013/14. The economic plan not only brought miraculous GDP growth but also has brought a shift on the contributions of the economic sectors. The services sector contributed 4.7 percentage points of this growth followed by industry and agriculture contributing 3 and 2.5 percentage points, respectively. While the share of agriculture in the GDP declined over ten years from 47% in 2004/05 to 39% in 2014/15 that of the services sector increased from 40% to 46% in the same period (Priewe, 2016).

Meanwhile, the contribution of the industrial sector remained low, at 15% of GDP in 2014/15. The strong economic growth has been underpinned by the country's public sector led development strategy, with its focus on heavy investment in infrastructure. (WBG, 2015; Admit, 2016). According to the World Bank, 2016, the economic boom is also accompanied by substantial progress across a broad range of social and human development indicators. During 2000–11, the rate of poverty has declined substantially from 44% to 30%, though income inequality remained unchanged at one of the lowest levels observed worldwide, and life expectancy increased from 52 to 63 years. By taking into consideration population growth of 2.4% per year, real GDP per capita increased by 8.3% per year during 2004–14. The increment substantially exceeds per capita growth rates achieved in the first decade after the country's transition to a market-based economy (1992–2003: 1.3%), under the communist Derg regime (1974–91: 1.0%), and during monarchy (1951–73: 1.5%) (Moller and Wacker, 2017). primary school enrollment is also quadrupled, halved child mortality rates, and doubled the percentage of people with access to clean water. The country also achieved the most rapid increase in access to improved sanitation facilities of any African country since 1990, moving from just 2.5% access to roughly 29% in 2016.2 The country has also been able to combine such improvements in service delivery with the third most significant decline in fertility rates and the third largest decline in the under nutrition rate among African countries since 1990 (EDTA, 2017).

After the Ethiopia-Eritrea war of 1998-2000, Ethiopia's economy has been one of the ten fastest-growing in the world. From 2004 to 2013, the country's average annual Gross Domestic Product (GDP) growth rate exceeded 10%, which was more than four percentage points higher than the average for Africa's 26 other low income countries. Unlike the other top five fastest growing African economies (Equatorial Guinea, Chad, Angola and Liberia), Ethiopia has achieved rapid economic growth without relying on natural resource exports (Bennett *et al.*, 2017). Moreover, the Government of Ethiopia (GoE) has accomplished much of this development in the context of the Horn of Africa, a region with a long history of instability and violence (EDTA, 2017).

The momentum of the economic growth of the country has started to accelerate when the country changed its investment focus from war and military related sectors to service and small industry sector. With this change of focus and diffident returns, the GoE laid out ambitious development targets called "Growth and Transformation Plan" (GTP I). The development plan put special targets in health, education, economic growth, and infrastructure, among other areas. It set a target of achieving lower-middle income status by 2025 (EDTA, 2017). Currently, the GoE has already launched the implementation of the second phase of the (GTP 2015), for the period 2015-2020, with continued mega high growth rates and structural changes toward industrialization and is also performing continual surge in economic growth (MoFED, 2010; Lars and Konstantin, 2015).

The purpose of the research is aimed at exploring the driving engine of the economic growth of Ethiopia after the 1998-2000 war with Eritrea. Furthermore, the study dissects and looks in to how the different factors of economic growth affect the economy growth of the country.

It is widely hypothesized that sound macroeconomic policies which emphasizes on the investment and enhancing of productive economic sector of a country promote economic growth by providing a more secure environment for public and private sector. Different studies and evidences suggests that good macroeconomic policy and its management is associated with faster economic growth (Bleaney, 1996; Lars and Konstantin, 2015)**.** Hence, the goal of this study is to investigate the determinants of economic growth of Ethiopia after the 1998-2000 Ethiopia and Eritrea war using OLS on panel data pertaining to core macroeconomic variables of structural, stabilization and external conditions collected from database of World Bank and IMF.

Related Literature Review
Economic Policy and Performances of Ethiopia
Prior the 1991, Ethiopia has experienced military regime which in principle used to follow socialist economic ideology. The economy of the country had been curtailed and the rural economy had been characterized by substantial direct and indirect taxation. Farmers had to pay a variety of levies, supply labor to community projects, and deliver a fixed quota of grain to the parasternal (Geda, 2006; Shiferaw, 2017). Trade beyond regional borders was banned for export crops and heavily taxed for food crops. The country's economy had bankrupted by the continuous war with the rebel groups and internal wars (Dercon, 2006). With the downfall of the military regime and the seizing power of the EPRDF in 1991 numerous economic policy and political administrations reforms ranging from devaluation of the Ethiopian monetary currency Birr to other major economic trajectory reforms were made. The reforms were gradual and more time consuming hence the structural changes and transformation of economy can be categorized to two; Pre and post 2003 (MoFED, 2010; WBG, 2015).

Governments design macroeconomic policies to promote growth, economic stability, high employment, low inflation rates, stability in the financial markets, and favorable conditions in the external balance (Mutuku and Elias, 2014). Achieving broad-based, accelerated and sustained economic growth so as to eradicate poverty has been and is a key objective of the Government of Ethiopia. The government has designed, and is implementing, strategies, policies and plans to guide and manage the overall development of the country accordingly (Mutuku and Elias, 2014).

The Plan for Accelerated and Sustained Development to End Poverty PASDEP had a medium term development perspective and aimed, at a minimum, at achieving the Millennium Development Goal (MDG) targets. During the PASDEP implementation period, high and sustained economic growth and significant social and human development results were realized. At the same period the economy grew on average at 11% per annum. The government aims to achieve the MDG targets by 2015, and its (MoFED, 2010).

According to the International Monetary Fund (2016), improvements in macroeconomic policy combined with structural reforms together with reliable external financing is fostering and stimulating economic growth in some least developing countries. A closer inspection of the

Ethiopian economic trajectories, the country partially fails the explanation. Unlike other developing countries Ethiopia emphasis on a state led model of development where huge investment and expansion of manufacturing pioneered by the state. This raises the question of how unique Ethiopia's recent growth performance has been and what factors can explain it.

Ethiopia's economic strategy during this recent period strongly emphasized public infrastructure investment and was supported by heterodox macro-financial policies (IMF, 2016). An increase in public infrastructure investment affects the economy (Abiad *et al.*, 2016). The public investment rate rose from about 5% of GDP in the early 1990s to 18.6% of GDP in 2011, making it the third highest in the world (Lars and Konstantin, 2015; Admit, 2016). Massive infrastructure investments took place in the energy, transport, communications, agriculture, and social sectors, albeit from very low levels. While agriculture was the main growth contributor at the beginning of the take-off, the services sector gradually took over in terms of importance and was later complemented by a construction boom and small and medium level industries (WBG, 2015; ADBG, 2016). The economic success of public lead development strategy which is focusing on heavy investment in infrastructure has continued attaining fast economic growth for more than a decade. It is growth of an average of 10.8% per annum, stands out as one of the fastest growing economies in the world.

In 2014/15, the country's real GDP grew by 10.2%, keeping the momentum of the 10.3% growth rate of 2013/14. The service sector and the industry and agriculture sector contributed 4.7 percent, 3 and 2.5 percent of the growth respectively (Admit, 2016). As per the data and trends of the public investment the government of Ethiopia has making massive strides towards the secondary economic sectors. This has started to get ground at the onset of the ADLI plan of the country which started at 2003. Initially the drivers of agriculture were the predominant sector contributing to GDP growth, accounting for 54.9% of GDP growth in 2004/05. However, in subsequent periods, its contribution to GDP growth has consistently declined, reaching 24.9% in 2014/15. The contribution of the services sector to GDP growth, on the other hand, rose from 37.5% to 46.1% over the same period while the contribution of the industrial sector to GDP in terms of both growth and share has been increasing, albeit from a low base. The sector's growth rate and its share to GDP were 21.7% and 15.2% in 2014/15, respectively (ADBG, 2016).

Ethiopia is in the midst of a sustained growth surge that is becoming increasingly broad-based, building on major improvements in educational attainment, improved health outcomes, and infrastructure capacity in terms of access to power, transportation and telecommunications (Mutuku and Elias, 2014). These make the country one of the fastest growing economy of Africa (Lars and Konstantin, 2015).

The Government's Growth and Transformation Plan sets ambitious targets for further improvements in these areas, together with significant reforms aiming to improve trade logistics, by rolling-out the authorized economic operator program across export-oriented industry parks and improving the main export corridor to Djibouti (MoFED, 2010). This industrialization push coincides with global trends that provide Ethiopia an opportunity to

integrate its economy into the modern "Made in the World" production system, including by attracting labor-intensive production, which is leaving China and other East Asian economies due to their rising wage rates (Henok Assefa, 2013). ADBG, 2016 and MoFED, 2010, to transform the economy, the GoE has to motivate the private investment sector particularly towards the policy strategic priority area of agro- based light manufacturing. Ethiopia is one of the two African countries piloting the Sustainable Industrial Development Initiative.

The GoE has selected the leather and leather products, textiles and garment and agro-processing subsectors as focus areas of the pilot initiative, which demonstrates that agriculture still remains the bedrock of Ethiopia's transformation plans. To address the various obstacles that have so far negatively affected private sector investment, the GoE has also embarked on the construction of industrial parks, including four integrated eco-friendly agro-industrial parks.

Effect of War on Economic Growth

Realties shows that exposure to war (or conflict) can have severe implications both at the macroeconomic level and for individual wellbeing. Adverse weather shocks and political unrests are found to be the leading threats for economic growth in Africa (Prospects, 2013). Conflict and war have both direct and indirect costs.

The direct cost refers to the material damage of war, such as the destruction of infrastructure, health and education facilities, and utilities. The indirect cost can be expressed in terms of forgone economic growth, for example due to shifts in fiscal policy with scarce resources being channeled to unproductive investments such as military expenses, slowing down infrastructure development (Weinstein and Imai, 2000).

The total cost of the conflict was estimated to be about USD 280 and 397 million for Eritrea and Ethiopia, respectively, in addition to nearly 50 to 75 thousands of troops lost for each country (Samuel G. W, 2016).

The Ethiopia-Eritrean interstate war also imposed a substantial economic downturn. Trade, tourism and investment decreased at an alarming rate due to a heightened sense of risk. It also threatened institutions and the rule of law. Moreover, it introduced tremendous uncertainty into the economic environment by making both public and private investment unsafe (Bezabih, 2014).

Ethiopia as a country who depend on imported food and other commodities were affected by the loss of access to ports due to the war though the country turned its attention and routes towards its neighboring countries port of Djibouti, Berbera, Zeila, Mombasa and Port Sudan. Beyond economic burden, relaying on the neighboring ports brought political difficulties on the country (White, 2005).

During the war, Homes, roads and bridges were targeted and destroyed during the war. The destruction of infrastructure and basic services caused havoc in the daily lives of the people. Water supply systems were contaminated or shut down by bombing of pipelines (Berhe *et al.*, 2005). In war zones, the destruction of infrastructures resulted in water contamination and an

overall shortage of safe drinking water. The war also resulted in considerable destruction of the homes of the inhabitants. The breakdown of essential infrastructure and other interacting factors increased the economic burden during the post-war reconstruction and rehabilitation process (Bezabih, 2014) .

Research Methodology

Research Design

The study before running OLS regression model has made several stability, and diagnostic muliticolliniarity tests. Mainly OLS regression used to assess the impacts of the selected macroeconomic variables on the economic growth of the country. These analyses provided answer to the research questions of what factors determine the economic growth of Ethiopia. The approach helps to address the basic variables that explain Ethiopia's recent (after 1998-2000's Ethiopia-Eritrea war) economic performances, how the factors are being changing over time and are contributing for the development of the nation in general. Furthermore, the assessment shades light on how much the level of the economic performance is attributed to the macroeconomic factors.

The empirical model that described the relationship between dependent variable and independent variable is expressed as follows;

$$GDP = f(AEL + BM + CPI + DC + GE + INV + INT + MCS + SCL + VAT) \quad (1)$$

The econometrics model for equation (1) can be formed as follows;

$$LnGDP_t = \gamma_0 + \delta_1 LnAEL_t + \delta_2 LnBM_t + \delta_3 LnCPI_t + \delta_4 LnDC_t + \delta_5 LnGE_t + \delta_6 LnINV_t + \delta_7 LnINT_t \quad (2)$$
$$+ \delta_8 LnMCS_t + \delta_9 LnSCL_t + \delta_{10} LnVAT_t + \mu_t$$

Table 1. Description of Model and Data Source

Variables	Descriptions	Source
GDP	GDP per capita, PPP (current international $)	World bank development Indicator (WDI)
AEL	Access to electricity (% of population)	WDI
BM	Broad Money (% of GDP)	WDI
CPI	CPI	WDI
DC	Domestic Credit (% of GDP)	WDI
GE	Govt. Expenditures (% of GDP)	WDI
INV	Investment (% of GDP)	WDI
INT	Individuals using the Internet (% of population)	WDI
MCS	Mobile cellular subscriptions	WDI
SCL	Schooling	WDI
VAT	Value Added Trade Openness	WDI

Furthermore, due to the interconnectivity and multicollinearity among the independent variables variance inflation factor is applied using the following equation;

$$VIF = \frac{1}{1 - R^2} \qquad (3)$$

Empirical Results and Discussion

The Unit Root Test Analysis

Prior running detailed assessment, the status of the selected data has to be tested in order to determine their order of stationarity, integration and also the null hypothesis (whether the data series have unit root or not) have to be tested.

Table 2: Stationary Analysis Results (Augmented Dickey-Fuller Test)

Variable	Code	t-statistic	ADF Critical Value (at 5%)
Access to Electricity	*AEL*	*-2.915522**	*-2.849777*
Broad Money	*BM*	*-3.536249**	*-3.483970*
Consumer Price Index	*CPI*	*-2.916566**	*-2.711800*
Domestic Credit	*DC*	*-4.582393**	*-3.495295*
Gross Domestic Product	*GDP*	*-2.882391**	*-1.946996*
Govt. Expenditures	*GE*	*-4.149148**	*-3.483970*
Investment	*INV*	*-2.912631**	*-2.597219*
Internet	*INT*	*-3.489228**	*-2.428223*
Mobile subscriptions	*MCS*	*-3.489228**	*-2.778188*
Schooling	*SCL*	*-3.897003**	*-3.483970*
Value Added Trade	*VAT*	*-3.489228**	*-2.493762*

(*) indicates significance at level (5% level). If t-statistics > ADF critical value, null hypothesis[1] is rejected, meaning that data of corresponding variable is stationary.

Augumented Dicky-Fuller Test (ADFT)

An Augmented Dickey–Fuller test (ADFT) is used to tests the null hypothesis whether a unit root is present in a time series sample or not. According to ADFT the more negative it is, the stronger the rejection of the hypothesis that there is a unit roots at some level. The test is important to check that in applying OLS Regression all the variables included in the regression are stationary or not. This implies that unit root test is the first step in dealing with variables in the estimation of models. This gives an idea that unit root test is a mechanism that helps us in determining whether the data is stable or not.

Based on the result on the unit root analysis and stationarity test (Augmented Dickey–Fuller test (ADF)) from the table 2, all the independent variables taken for the research are stationary. The result shows that all the variables has no unit root and are stationary. Hence we reject the null hypothesis of the test and accept the alternative hypothesis. Therefore, the data allows us to use ADFT on the data and check the effects of the independent variables on the economy growth of the country.

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[1] *Null (H0): There is unit root (data is non-stationary), alternative (H1): There is no unit root (data is stationary)*

Table 3: Diagnostic and Stability Analysis of Model

Test Type	F-statistic	Prob.
Jarque-Bera	*3.3107*	*0.1910*
Breusch-Pagan-Godfrey	*1.6750*	*0.1119*
Breusch-Godfrey LM Test	*2.2361*	*0.1532*
CUSUM Test	*Stable**	
CUSUM of Squares Test	*Stable**	

(*) see corresponding graphs for both tests in appendices. If blue line motions with in two red lines, it indicates stability and systematic movement of parameters, if it cuts the red line anywhere, the parameters are declared as unstable[2].

Stability and Diagnostic Test

Diagnostic check is undertaken in order to determine consistency of the estimated long run model which essential to know the standard property of the model. Hence, this study conducted the model stability and diagnostic checking which comprised of Serial correlation test (Brush & Godfray LM test), Functional form (Ramsey's RESET) test, Normality (Jaque-Bera test), and Hetroscedasticity test. Additionally, stability of the long run estimates is tested by applying the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMSQ) test. Such tests are recommended by Pesaran *et al.* (2001). In decision to accept or reject the null hypothesis, the p-values related to the test statistics are taken into consideration. The models passed all the diagnostic tests against serial correlation Breusch-Godfrey LM test and Breusch-Pagan-Godfrey, and normality of errors (Jarque-Bera test) suggests that the model is well specified.

The above tables indicated that the long run ADF test estimated in this study passes all the diagnostic tests. This is because all the independent values taken are unable to reject the null hypothesis specified for the test. Again, detecting the stability of the model for long run and short run relationship is reported by using the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMSQ) tests. Between two critical lines if the cumulative sum goes outside the bound (i.e. never returns back), the test shows serious parameter instability (see the appendix). Graph 1 and 2 show the plots of both the CUSUM and CUSUMSQ for the models. It can be seen from the figures that the plot of CUSUM stays within the critical 5 per cent bound for all equations, and CUSUMSQ statistics does not exceed the critical boundaries that confirms the long-run relationships between the

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[2] *Table 3 depicts the diagnostic and stability analysis of model. All tests reveal that the regression model used for estimation satisfies all basic requirements of good estimation. Jarque-Bera is applied for normality conditions; F-statistics result indicates that data fulfils normality condition[2]; Breusch-Pagan-Godfrey test checks the Heteroskedasticity[2]; Breusch-Godfrey LM Test identifies the serial correlation[2] in model; the CUSUM Test guides determining the stability of parameters and CUSUM of Squares Test witness systematic movement of parameters.*

economic growth and the variables, on one hand, and public investment and the other variables, on the other hand.

It also shows that the stability of coefficient plots lie within the 5 per cent critical bound, thus providing evidence that the parameters of the model do not suffer from any structural instability over the period of study. On the similar way, the figures critical limits are not crossed with the plot of CUSUM test. On the same way, the lower and upper critical limits are not crossed by the CUSUMSQ test. This has an implication that there are stable long run estimates and no structural break. Hence, it is evident that the models passed all the required tests and thus paving way for interpretation of estimates of both the long-run and short-run coefficients as required in an OLS approach.

Table 4: Ramsey RESET Stability Test

Test Statistics	Value	Probability
t-statistic	1.274011	0.2084
F-statistic	1.623105	0.2084

If value of t-stat and F-stat is not significant with respect to p-value respectively, the Ramsey RESET test holds the stability condition valid.

Multicollinearity Test

The Variance Inflation Factor (VIF) test has been used to check the muliticollinarity between the independent variables in the model. According to the results from the table 5 all the VIF results of the independent variables are much more less than 5, hence the test proved that the multicollinearity among the variables are very much less and the estimation of the model produces more reliable results.

Table 5: Variance Inflation Factor

Variance Inflation Factors		
Variable	Variance	VIF
AEL	0.0019	3.8970
BM	0.0018	1.8829
CPI	0.0005	2.8573
DC	0.0002	3.8140
GE	0.0002	1.8562
IN	0.0009	1.9535
INT	0.0004	3.8458
MCS	0.0006	3.8688
SCL	0.0012	2.2208
VAT	0.0002	3.0124
C	0.0087	1.3290

If VIF>5, Multicollinearity exists, and regression estimation in that case is considered instable. If VIF<5, the estimation seems to produce more reliable results.

Explaining the Growth Performance

Economic growth in 2000-16 was driven primarily by structural improvements, according to the regression results. According to the estimation of the regression from table 6 shows that almost all of the (predicted) growth performance of the 2000-2016 periods can be attributed to factors related to structural changes (see descriptive statistics; annex II).

The model estimates these factors to have contributed positively on the GDP per capita PPP growth. Based on the findings of table 6, inference can be made that public infrastructure investment and restrained government consumption were the key structural drivers of growth. These two factors are linked with expansion in budgetary infrastructure investment and were facilitated by reduced government consumption, arising partly as a result of a 'peace dividend' effect following the end of the 1998-2000 war with Eritrea. Due to these, the country is able to make huge strides of investment in the energy, transport, communications, agriculture and social sectors, even if from very low level (Lars and Konstantin, 2015). In comparison with other factors selected, AEL, GDP (mainly driven by the agriculture sector then by the service sector), INT, MCS, SCL, and GE showed dramatic changes after 2000 GC and highly impacted the economic growth of the country (see annex II).

The country made major step towards investment projects under GTP I and GTP II. These include, in the energy sector, the Great Ethiopian Renaissance Dam (6000MW), Gilgel-gibe III (1,870 MW) and Genale Dawa III (254MW) hydropower projects, as well as the Adama and Ashegoda wind power projects and on road and railway infrastructures project include Railway infrastructure projects include the Addis Ababa-Djibouti (900km), MekelleHara-Gebeya (268km), Hara-Gebeya-semeraAssayita (229km), and the Awash-Kombolcha Hara-Gebeya (278km) corridors. With these the federal and regional road network has increased from 26,500 km in 1997 to 60,000 km in 2014. Railway lines connecting Addis Ababa with the Port of Djibouti as well as a Light Railway line in the capital has been completed and are expected to fuel the economic growth of the nation (IMF, 2016).

The mobile internet user increased dramatically with in very short period of time and is also expected to increase time after time if the country maintains its economic growth momentum. Furthermore, Ethiopia made substantial efforts in improving access to educational service to its population. The growth enhancing effects of the country is reflected in the model.

Results of the Multiple Regression

Table 6: Ordinary Least Square Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
AEL	0.0381	0.1373	0.2776	0.7824
CPI	-0.3281	0.0675	-4.8610	0.0005
DC	-0.3548	0.0974	-3.6425	0.0006
BM	-0.2595	0.0633	-4.1025	0.0001
GE	0.3625	0.0545	6.6500	0.0000
IN	0.2934	0.0835	3.5132	0.0001
INT	0.2730	0.0492	5.5479	0.0002

MCS	0.2261	0.0593	3.8116	0.0014
SCL	0.3717	0.0685	5.4285	0.0000
VAT	-0.2838	0.0970	-2.9266	0.0394
C	-0.2905	0.0895	-3.2475	0.0020
R-squared	0.8890	F-statistic	49.8253	
Adjusted R-squared	0.8857	Prob (F-statistic)	0.0000	
Durbin-Watson stat	1.9881			

The results of the estimation show that the values of almost all the variables are significant at 5% significant level. GE, SCL, MCS, IN and INT are the strong determinants of the GDP per capita PPP according to the results. The significant result of the CPI, DC, BM and VAT shows that these variables have significant impacts on the GDP per capita PPP. As per the result AEL does not significantly affects the GDP per capita PPP of the country. Also the result of the table 6 shows the value of the probability is greater than 0.05 and also the value of the t-statistic are less than the absolute value of 2.

Conclusion and Implications

Empirical examination were made to assess the AEL, BM, CPI, DC, GDP, GE, INV, INT, MCS, SCL and VAT's impacts on the economic performance of Ethiopia after the war of 1998-2000. Before running any regression test the study has conducted An Augmented Dickey–Fuller test (ADFT) to check the null hypothesis whether a unit root is present in a time series sample or not. The study also conducted stability and diagnostic checking which comprised of Serial correlation test (Brush & Godfray LM test), Functional form (Ramsey's RESET) test, Normality (Jaque-Bera test), and Hetroscedasticity test. Additionally, stability of the long run estimates is tested by applying the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMSQ) test.

The estimated ADF test indicated the variables passed all the diagnostic tests. This is because all the independent values taken are unable to reject the null hypothesis specified for the test and the result shows that all the variables has no unit root and are stationary. Hence we reject the null hypothesis of the test and accept the alternative hypothesis. Therefore, the data allows us to use ADFT on the data and check the effects of the independent variables on the economy growth of the country.

Again, detecting the stability of the model for long run and short run relationship is reported by using CUSUM and the CUSUMSQ tests. The finding shows that the stability of coefficient plots lie within the 5 per cent critical bound, thus providing evidence that the parameters of the model do not suffer from any structural instability over the period of study. On the similar way, the figures critical limits are not crossed with the plot of CUSUM test. On the same way, the lower and upper critical limits are not crossed by the CUSUMSQ test. This has an implication that there are stable long run estimates and no structural break. Hence, it is evident that the

models passed all the required tests and thus paving way for interpretation of estimates of both the long-run and short-run coefficients as required in an OLS approach. To handle the multicollinearity issue the study employs VIF, articulates that all independent variables do not have collinearity problem.

The empirical evidence of the analysis of the study shows that the independent variables taken have significant impact on the dependent variables. Government Expenditures, Individuals using the Internet, Investment, the growth of domestic production and Schooling have strong positive impact on the GDP per capita PPP growth. These imply that GE has potentially being used for the economic growth and the potential usage GE to productive sectors brought more productivity and welfare of the nation. This implies that the alteration on the government expenditure from the military and war fare to economic sector has boosted the economic growth of the country together with other factors of economic growth. This reform of progressive usage of GE may continue to lift the living standards of the citizens and may contribute to the country's objective of meeting middle income country by 2025.

The results obtained also show that public investment is continuingly increasing and is also found statistically to have significant effects on GDP per capita growth of the country. Hence, continuous use of investment may improve the social and economic condition of the socio-economic condition of a nation (Abiad *et al.*, 2016). The rate of return of the investment afterwards the 2000's war with Eritrea is very high and the time series data ascertains that the government of Ethiopia has to encourage and continue to investment to the limit it pays off positively.

As the economies of developing countries are generally not well diversified compared with those of developed countries (Tu and Tan, 2012; Jiang *et al.*, 2013), and foreign direct investment is limited, Optimal decisions is vital to over-weighting constraints, which may distort investors' optimal investment decisions. With these in hand, there are signs that public investment in Ethiopia is becoming 'too much of a good thing', as it is pushing the country towards achieving its intended target of reaching middle income countries by 2025 especially when compared with the level of private investment. The empirical analysis also gives an inferential lead about the drivers of the economic growth of the nation. The economy growth after the war of 2000 can be attributed to structural factors. The model estimates all the factors selected for structural factor contributed significantly than the other factors. These facts are also supported by the World Bank 2016, saying that "Ethiopia has the third highest public investment rate in the world, but the sixth lowest private investment rate. Public investment has been rising since the end of the 1990s, while private investment has been declining (as a share of GDP).

Needless to say, there are also some problems in the government associated with handling of the monetary policy. As depicted in the annex II and table 6, CPI is raising and need to be checked to enable the economic growth sustain. Also Broad money was growing relatively faster until 2011, and then currently is showing relatively a slowdown. This may slow down the government enterprise and public investment to shrink though maintaining low levels of reserve money and broad money growth would further cement the public's view of successful fighting

of inflation in Ethiopia and hence contribute to lower inflation expectation. Furthermore, maintaining single-digit inflation requires continued monetary discipline to maintain low inflation expectations and support from fiscal policy; lower oil prices will also help.

Appendices

I. CUSUM and CUSUM of Square Test
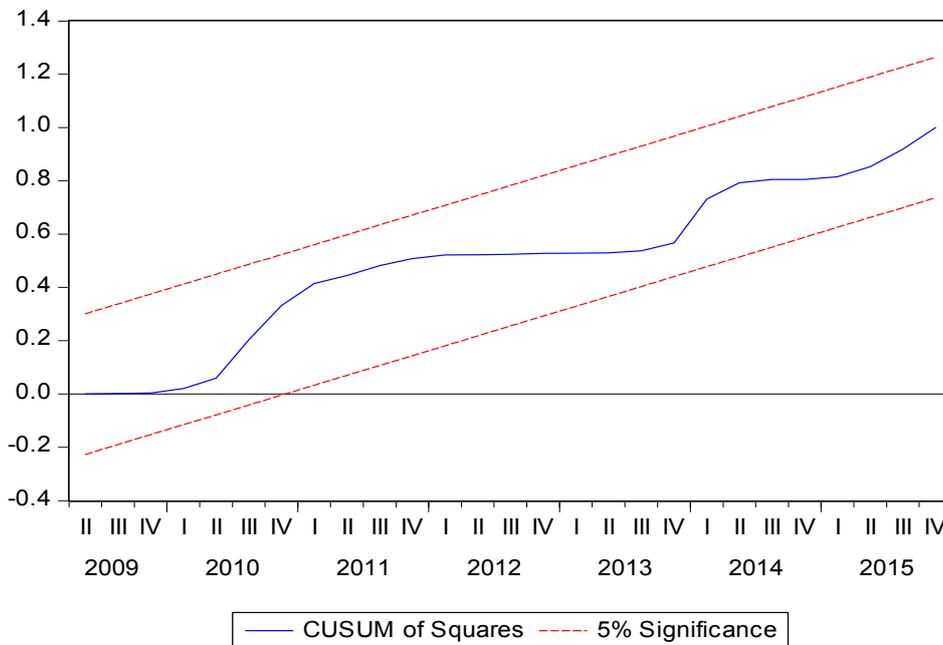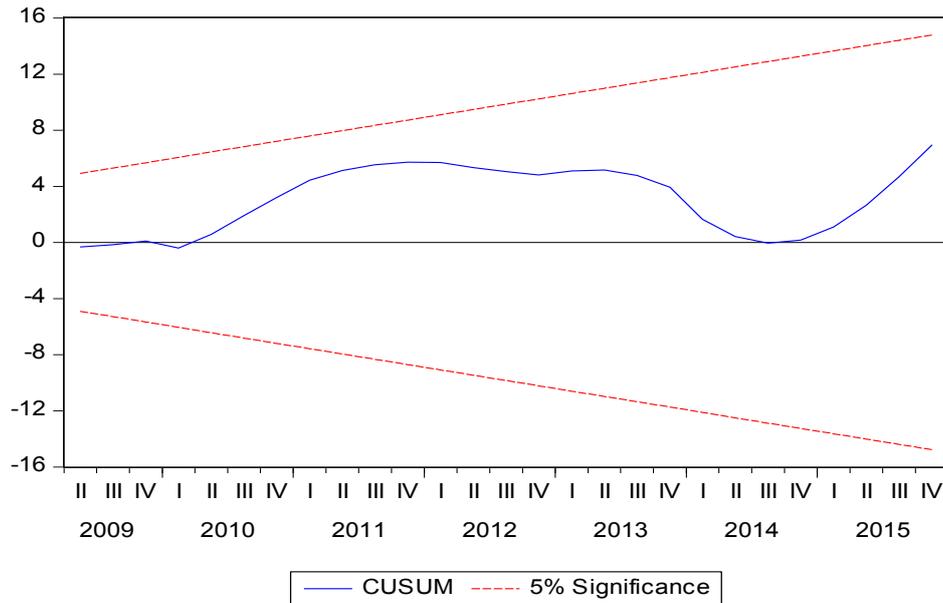
II. Descriptive Statistics of selected variables
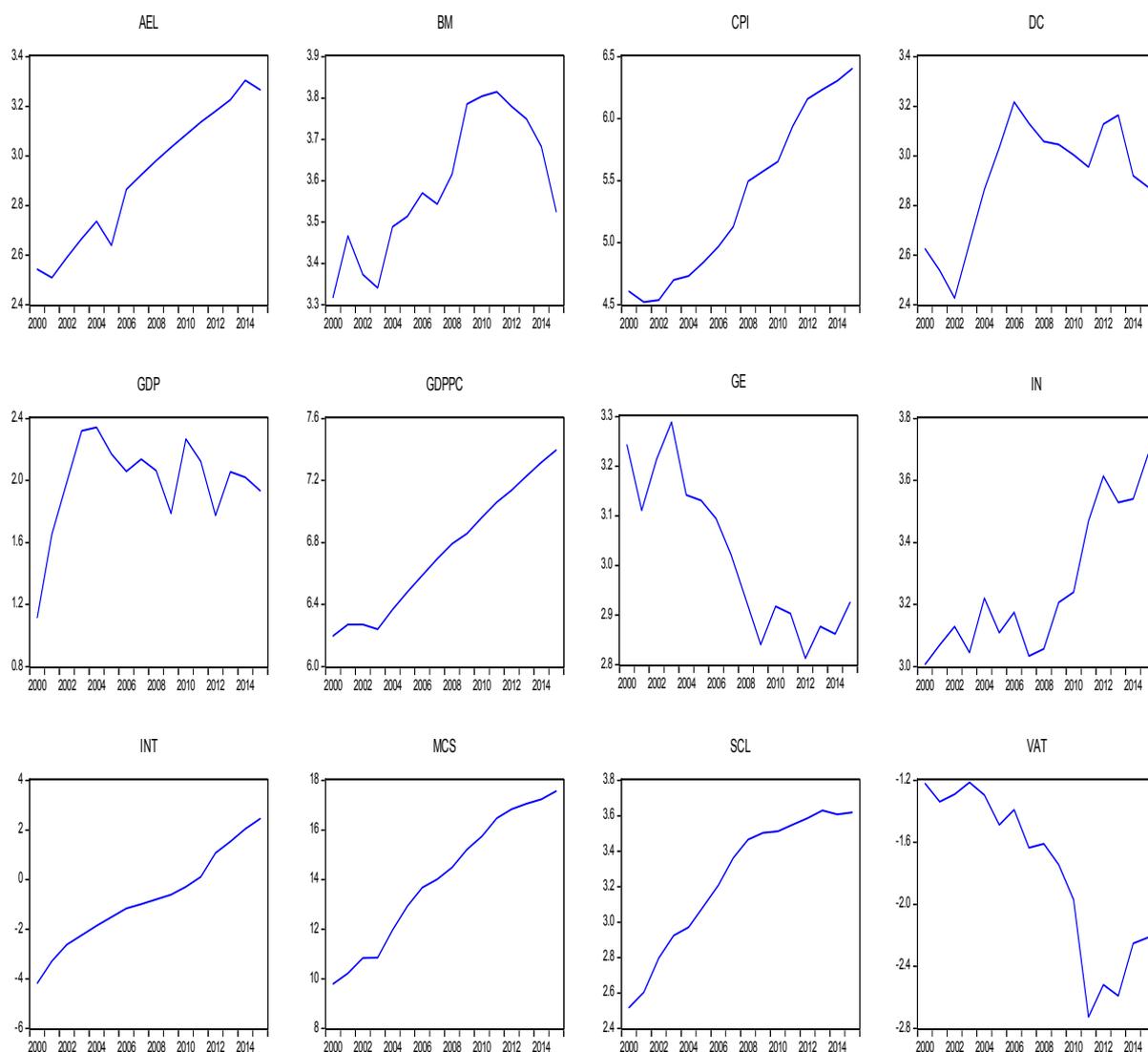
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