

Is Geography Really A Determinant of Economic Growth and Development in Sub-Saharan Africa?

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Abstract: Blaming Africa's underdevelopment on geography (landlockedness) and climate (malaria) is to confuse the cause of under-development with its symptoms. But if landlockedness is such an obstacle to economic development, how do we explain the case of Uzbekistan. The objective of the paper is to empirically determine whether geography and climate is really a major constraint to sub-Saharan African economic development especially when it is endogenized. The study used the dynamic system GMM method. The independent variable of our study was the gross domestic product index(GDPindex) while the independent variables include: landlockedness, malaria, proxies for geography and climate, total factor productivity, human development index, government expenditure (% of GDP), electricity (infrastructure), resource boom, population growth rate, credit to the private sector, inflation rate, exchange rate, trade openness, external debt to GDP ratio, and unemployment. The fixed and random effects regression results show that total factor productivity, human development indicator and trade openness were positively related to GDP index, while the other variables were negatively related to economic growth. The study, therefore recommended among others the need for sub-Saharan policy makers to focus on the building of human capital as a critical driver of economic growth and the enhancement of regionalism as a framework for ensuring the effective use of human resources for fostering competitiveness in a bid to promote and sustain growth potentials within the sub-region.

Keywords: *Geography, climate, competitiveness, HDI, GMM method, sub-Saharan Africa*

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I. INTRODUCTION

Arguably, the most popular of the meta-structural explanations of the African growth "tragedy" in the literature has been on those of geography and climate (Diamond, 2012; Sachs, 2003). Most significantly, Africa's proximity to the equator made the proponents of geography and climate to believe that African countries no doubt suffers from tropical diseases, such as malaria. These diseases as they believed hold back economic growth and development by reducing workers productivity and raising healthcare cost. They also believed that agricultural productivity in the tropics is lower than in the temperate region following the same acclaimed burdens of geography and climate (ECA, 2016).

Geography is defined here in terms of the constraints imposed by Africa's atypical hostile geography that has shaped the nature of African societies and their interactions with the rest of the world. Soludo(2000) summarized the symptoms of this hostile geography to include its most tropical features, including the prevalence of tropical diseases, climate, soils, topography and ecology. Buttressing further, it has been emphasized that many African countries are landlocked and thus are disadvantaged in integrating into the global economy through international trade (Collier, 2007; Bloom & Sachs, 1998; Sachs, 2012). Many African countries are also said to be in "bad neighbourhood" as they are surrounded by other poor countries that have small markets, which restricts their trading opportunities; many of them suffer violent conflicts, which often spill over into neighbouring countries, with obvious negative consequences for economic growth and development.

The study is therefore set out to empirically determine the impact of geography as a driver of economic growth and development in sub-Saharan Africa

1.2 The Statement of the Problem

It is true that few African countries are landlocked. It is also true that, in a world with low sea freight cost, other things being equal, it is more expensive for landlocked countries to trade with the outside world. But if being landlocked is such an anathema to growth and development, how do we explain that of Uzbekistan, the most successful post-soviet Republic as one of the only two countries in the world that are double-landlocked

(the other been Liechtenstein)?(ECA, 2016). Equally, puzzling are the economic successes of Switzerland and Austria. These are two of the richest economies in the world that are landlocked.

One may tend to argue that they could develop despite being landlocked because they had good river transport, but many landlocked African countries are of the same position and by nature similar to Switzerland and Austria. For example, Burkina Faso (the Volta); Mali and Niger(the Niger); Zimbabwe(the Limpopo) and Zambia(the Zambezi).

Being a “bad neighbour” may not after all be an encumbrance as it may seem to development prospects. Furthermore, India is a good counter-example. In the last couple of years, India has grown fast, despite being in the midst of the worst neighbours in the world. South Asia, where India is located, is literally the poorest region in the world –poorer than Africa (excluding North Africa). South Asia is also a highly conflict-ridden region. India own Hindu-muslin tension, which frequently erupts in violent clashes and its perennial military conflict with Pakistan are well known. It should also be pointed out that many today’s rich countries used to suffer from their climates, if not necessarily from agriculture conditions. Singapore, which is in the middle of the tropics, is a good example. Incidence of malaria and other tropical diseases in the USA, Japan and Italy, for example again, do not matter due to improved sanitation and enhanced medical capabilities. From the foregoing, two research questions become pertinent. They are:

- If we endogenize geography, climate and diseases, are there other factors that can drive growth and development in sub-Saharan Africa?
- What role has human capital in promoting economic growth and development in sub-Saharan Africa?

1.3 Objective of the Study and Justification

In broad terms, the study seek to determine the impact or otherwise of geography in explaining sub-Saharan Africa’s growth potentials. Specifically, it investigates the impact of landlockedness, malaria, human capital, and resource boom as drivers of economic growth and development in sub-Saharan Africa.

In submissions, there are quite a number of studies that have investigated the relationship between geography and economic growth. While some of the previous studies (Bloom & Sachs, 1998; Collier, 2005; Gallup, Sachs and Mellinger, 1999; Abidoye & Odusola, 2015; Khawar, 2014; Alagidede et al.,2014) focused on geography and climate as major drivers of economic growth and development in Africa as a whole, the current study endogenizes geography to explain the key drivers of economic growth and development in sub-Saharan Africa.

This is based on the avowed premise that blaming Africa’s underdevelopment on geography and climate alone is to confuse the cause of underdevelopment with its symptoms, as adverse geography and climate may not explain the growth scenarios of African growth and development prospects alone.

Moreover, on the empirical front, since this study examines not just the same variables used by previous studies, its empirical results will be obviously different, thereby providing more robust evidence for policy responses.

1.4 Some Stylized Facts on Africa’s Economic Growth and Development

Over the years, most remarkably from the 1990s to date, African economies have recorded rapid growth rates, although with declining human indicators. Starting from 2012, gross domestic product -GDP growth rate averaged 6.6 percent, during the period, developed nations were experiencing growth contractions and stagnations. The growth profile of African economies has been attributed during the period to economic reforms across Africa as well as commodity price boom and capital inflows. However, one serious concern about the growth trend and patterns of African growth trajectory is the non-inclusiveness of the growth process. As an aftermath, poverty and unemployment remains high and worrisome. Trend evidence has shown that the percentage living below \$1.25 a day in sub-Saharan Africa (SSA) declined from 51.5 percent in 1981 to 48.5 percent in 2010 while the number of people living below the poverty line increased significantly from 204.9 million in 1981 to 414 million people in 2010. Similarly, income inequality (almost 0.50 in Gini coefficient), lack of participation and opportunities in the economies, and unemployment, particularly the youth are all increasing. The pattern of income inequality for example in West Africa revealed that average income inequality decreased sometimes around 2016. While sub-Saharan Africa’s poverty incidence is declining, it has had the highest incidence at US\$1.9 per day among the global region from 1993 to 2016. Sub-Saharan Africa is also the only region in which the number of people living under the poverty line has maintained a sustained increase since 1990 to date when compared to South Asia and the Pacific region where there had been a decrease in both the number and percentage of those living under the poverty line (Anyanwu, 2017).

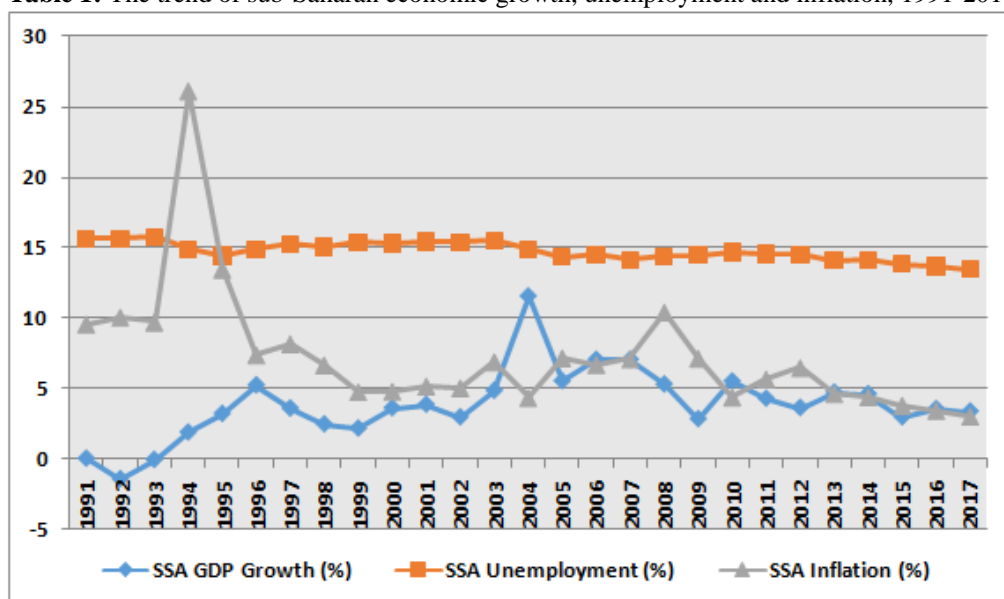
The African emerging scenario was further elucidated by the World Bank (2016) estimates showing that the South East Asia and the Pacific region had 71.0 million people or 3.5 percent of the population living on less than US\$1.9 a day in 2013, down from 965.9 million(or 60.2%) in 1990.The estimates also showed that

though the percentage living below US\$1.90 a day in SSA declined from 54.3 percent in 1990 to 41.0 percent in 2015, the number of people living below the international poverty line increased significantly.

Sub-Saharan Africa's competitiveness, which here is taken as an indicator of productive efficiency that could drive total factor productivity (TFP) in international context, has not recorded a smooth trend and profile. Taking a global comparative analysis, both North Africa and sub-Saharan Africa are out-performed by Southeast Asia and by all of the BRICs economies. Analytically, only two countries from the sub-Saharan African sub-region features in the top half of the overall global ranking: South Africa and Mauritius. South Africa and Mauritius are behind China and as well as behind Southeast Asia and India, but ahead of Brazil, Russia, and other regional averages. The remaining sub-Saharan African countries that do better than the regional averages are Rwanda, Gambia, Benin, Senegal, Kenya, Cameroun, Tanzania, Ghana and Zambia (WEF, 2016). Technological readiness is an area where sub-Saharan African countries performed quite poorly as a group and where they are well behind the OECD averages (Aliu & Ichoku, 2015). The poor technological readiness in Africa no doubt, affects the growth prospect of the African economies.

Summarizing the trends and patterns of African growth profile, Ndulu and O'Connell (2005) concluded on the five features of African growth as follows: i) Divergence of income, ii) slow accumulation and productivity growth, iii) limited structural transformation, iv) lingering volatility, v) diversity.

Table 1: The trend of sub-Saharan economic growth, unemployment and inflation, 1991-2017



Source: WDI (2017)

It was observed that inflation rate within the sub-Saharan Africa reached its peak in 1994 following strong capital inflows, rapid credit growth, tightened labour markets and widening current account deficit. Also, rising export earning that pushed up aggregate demand and facilitating domestic credit growth. This was further made manifest by the surging commodity (food) price boosted inflation across the global economy. High food and fuel prices again, contributed to the substantial increase in the inflation trend in emerging markets and low-income African countries (Epinosa et al., 2010).

SSA recorded high unemployment rate during the period 1991 to 2017. This is mostly youth unemployment traced to a number of factors including the activities of the political leaders as a result of mismanagement of resources and adverse macroeconomic policies of various governments, by not channeling human and natural resources into profitable investment that are needed to yield the maximum economic growth within the region. In consequence, the youth unemployed are more likely to engage in criminal activities as terrorists and suicide bombers, Boko Haramists, as well as the recruitment of young combatants for armed conflicts, which are harmful to the sub-Saharan Africa economies (Obadan, 1997; Fosu, 2005)

II. THE LITERATURE REVIEW

Scholars, policymakers and other stakeholders have long debated the determinants or drivers of economic growth. The most fundamental determinant of economic growth identified by both neoclassical and endogenous growth models are investment, hence, a lot of empirical works focused on it (Kormendi & Meguire, 1985; Levine & Renelt, 1992; Mankiw, 1992; Auerbach, et al., 1994; Barro & Sala-i-Martin, 1997;

Podercca & Carmeci, 2001;Uwatt, 2003; Fowowe, 2008; Abou-Ali & Kheir-El-Din, 2009. However, findings are not conclusive.

Another major factor hypothesized as affecting economic growth is government expenditure whose effect can be negative or positive. The burden of government is usually proxy by the ratio of government consumption to GDP. Barro (1996), using a panel of about 100 countries from 1960 to 1990, revealed that economic growth is enhanced by lower government consumption, the real per capita GDP, higher initial schooling and life expectancy, lower fertility, better maintenance of the rule of law, lower inflation, and improvements in the terms of trade.

Anyanwu (2011) surveyed the aid-growth literature in an empirical study of the effects of foreign aid on Africa's economic growth based on time series data from 1958 to 2001 and constructed a 5-year averages of end-periods, covering 53 African countries. The study revealed that aid has a positive impact on growth, and that the impact does not depend on the policy environment. Theoretically, it has been posited that trade openness affect economic growth through various channels; including the exploitation of comparative advantage, technology transfer and diffusion of knowledge, increasing scale of economics and competition. However, empirical results have been mixed. Balamoune(2009), for example, showed that trade openness seems to have positive effects in African countries with higher income and negative effects in lower income ones. Meanwhile, Fowowe(2009) shows no significant effect of openness on SSA growth.

Human capital through several endogenous growth models have been identified as yet another driver of economic growth. Researchers on these drivers of growth include: Barro , 1991; Mankiw et al, 1992; Barro & Sala-i- Martin, 1995; Brunetti et al, 1998; Hanushek & Kimko, 2000; Fayissa & Nsiah, 2010.

Inflation also has been posited as a driver of economic growth and it measures the lack of price stability as well as the quality of fiscal and monetary policies and hence macroeconomic stability. Abou-Ali and Kheir-El-Din(2009), in a study, revealed that inflation has a significant negative impact on economic growth.

Political instability, political and civil freedom, political regimes, and the degree of democracy have also been identified as playing critical roles in economic growth. Empirical results from the studies of (Kormedi & Meguire, 1985; Scully, 1998; Grier & Tullock; Lensink et al; 1999; Lensink, 2001) have shown that democracy appears to have mixed effects on economic growth and in most cases is unsuccessful in explaining economic growth prospects. In a similar study, Dreger et al., (2012) revealed that political institutions including democracy do not have any conclusive effect on economic growth.

Institutional framework including voice and accountability, political stability, government, government effectiveness, regulatory quality, rule of law, control of corruption, and government repudiation of contracts, risk of expropriation, property rights and bureaucratic quality are some identified drivers of economic growth as espoused in the literature. Some noted researchers here are (Knack and Keefer, 1995; Mauro, 1995; Hall & Jones, 1999; Rodrick, 1999, 2000; Acemoglu et al, 2002; Mijiyawa, 2008).

Demographic trend, including population growth, population density, migration and age distribution, and urbanization and urban population are yet another identified drivers of economic growth. Studies like (Brander & Dorwick, 1994; Kelly & Schmidt, 1995; Bloom & Williamson, 1998; Kalemli-Ozcan, 2002) have shown that high population growth could have a negative impact on economic growth influencing the dependency ratio, investment and saving behaviour and quality of human capital(Petrakos et al. 2007)

Relevant studies on geography (Bloom & Sachs, 1998; Collier, 2005; Gallup, Sachs & Mellinger, 1998, 1999) revealed that location and climate have large effects on income levels and income growth, through their effects on transport costs, diseases burdens, and agricultural productivity, among other channels.

Credit to the private sector and natural resources boom have also been identified as critical drivers to economic growth. The study of Arezki and Glyfason(2011) showed that credit to the private sector has a largely negative and insignificant relationship with economic growth. Also, the study of Allen and Ndikumana(2000) has shown no significant effect of private sector credit on economic growth in Southern Africa while Loayza and Ranciere(2006) showed a negative effect of credit expansion on economic growth. While Collier and Goderi(2012) in a study showed that commodity boom have positive short-and long-run effects on output, but non-agricultural booms in countries with poor governance have adverse long-term effects which dominate the short-run gains. However, empirical evidence from the studies of (Blanchard & Gali, 2007; IMF, 2007; Anyanwu & Erhijakpor, 2009; AfDB, 2007) have all revealed that oil prices has a strong negative effect on economic growth.

III. ANALYTICAL FRAMEWORK, MODEL SPECIFICATION AND DATA SOURCES

3.1 Analytical Framework/Model Specification

In the Sources of Growth Analysis, Robert Solow (1957) developed a procedure; growth accounting that focused directly on the contribution of each term in the production function. The model takes the general form:

$$Y = F(K, L, A)$$

3.1

Where Y=Output, K=capital, and A= parameter to capture the effects of variables other than capital stock and labour supply which might influence growth (this may include increasing technology, workers skill levels, education, health, landlockedness, disease burden, infrastructure, competitiveness, institution and resource boom and so on). A, is generally referred to as total factor productivity. Since A captures not only production efficiency gain but also the net effect of errors and omissions from economic data, the residual A is sometimes referred to as a measure of ignorance about the growth process. Based on the foregoing framework, the relationship we want to estimate following a panel model can be written as follows:

$$\ln \text{GDP index}_t = \alpha_i + \beta_1 \ln(\text{Landlocked})_t + \beta_2 \ln(\text{Malaria}) + \beta_3 \ln X + t_t + U_c + \text{DM} + U_i \quad 3.2$$

Where $\ln \text{GDP index}$ is the log of index of GDP growth rate at time t ; α_i is a fixed effect reflecting time differences between countries; β_1 is the elasticity of growth with respect to landlockedness, our proxy for geography, β_2 is the elasticities of the control variables, including total factor productivity, human development index(education, health and nutrition, derived through principle component analysis, CPA), government expenditure, foreign direct investment as a percentage of GDP, trade openness as a percentage of GDP, electricity(infrastructure), resource boom, population growth, credit to the private sector, inflation rate, exchange rate , external debt as a percentage of GDP, and unemployment, t_t represents the time fixed effects, U_c represents the country-fixed effects ,DM is dummy for the selected countries in SSA that are not landlocked and μ represents the error terms

3.2 The Data Sources

The panel data set for 20 sub-Saharan African countries from 1991 to 2017 was compiled for the purpose of the paper. The 20 SSA (see appendix) countries out of the 48 countries in sub-Saharan Africa that were compiled are due to data availability. All data series are annualized data set. The data were sourced from the World Bank Development Indicator (2018) Online.

Given the dynamic nature of the model and the dataset as well as the presence of fixed effects to account for unobserved country heterogeneity, the model is estimated using the Arellano- Bover/Blundel-Bond system GMM estimator. The validity of the moment conditions were carried out by means of the Sargan test of overidentifying restrictions. The test for the null hypothesis of no second order serial correlation in the error term was carried out using the Arellano- Bond test for autocorrelation. Table 1 provided detailed description of the raw dataset. It reports the sample mean (averages), median and standard deviation of the variables used in the estimation.

Table 1: Sub-Saharan Africa: Descriptive Statistics Regression Variables, 1991-2017

Variable	Mean	Median	Maximun	Minimum	Std. Devi
GDPindex	41.21	43.29	44.06	41.21	6.01
Landlocked	3.28	4.02	5.26	3.23	0.26
Malaria	2.57	3.11	4.03	2.51	0.42
TFP	30.46	16.29	17.25	14.32	2.10
HDI INDEX	28.47	26.01	27.03	21.23	3.01
Government expend.	46.28	45.18	45.07	40.24	10.24
Electricity	11.47	12.64	13.42	10.26	1.47
Resources boom	25.06	23.54	24.28	21.27	3.00
Population growth	7.24	6.02	7.02	5.03	0.29
Credit to private sect.	20.22	13.36	14.26	10.00	22.6
Inflation rate	54.59	5.81	6.02	4.21	561.206
Exchange rate	58.24	6.22	7.22	5.00	426.22
Trade openness	78.19	71.56	54.002	25.17	39.58
External debt(% of GDP)	90.47	63.88	61.21	31.42	110.70
Unemployment	70.63	46.25	45.25	40.22	28.21

Note: These are the raw data before the log transformation

Source: Researchers Computation using WDI (2018).

IV. EMPIRICAL RESULTS AND DISCUSSIONS

The results presentation commences with the panel data regression of economic growth drivers in sub-Saharan Africa. The result is presented in Table 2.

Table 2: Panel Regression Results of Economic Growth Drivers, 1991-2017

Explanatory Variables	Fixed Effects	Random Effects
Constant	1.824(2.628)	0.243(0.721)
GDP index	-0.068(1.407)	-0.034(1.172)
Landlocked		-0.0019(0.652)
Malaria		-0.002(1.324)
TFP	0.266(4.66)	0.785(17.45)
HDI	0.352(5.271)	0.362(5.710)
Credit to the private sector	-0.052(1.891)	-0.013(0.630)
Electricity	-0.123(1.76)	-0.223(0.781)
Inflation rate	-0.050(1.644)**	-0.050(1.920)**
Exchange rate	-0.250(4.023)**	-0.115(3.709)***
Population growth	-0.128(0.643)**	-0.123(0.547)**
Trade openness	0.548(6.789)	0.314(4.132)
External debt(% of GDP)	-0.162(4.307)***	-0.026(2.346)***
Unemployment	-0.031(2.911)**	-0.015(2.213)**
Resource boom	-0.234(3.437)	-0.232(2.431)
R ²	0.952	0.958.
Adj. R-Squared	0.969	0.965
S.E . of Regression	0.106	0.125
Durbin Watson	1.824	1.766
No of countries	20	20
No of Observation	467	467

Note: The figures in brackets are the t-values. The significance of the coefficients are indicated by ***(1%), **(5%), *(1%)

Source: Researchers Computation using WDI(2018)

The fixed and random effects regression result of determinants of economic growth in SSA is represented in Table 2. The estimation result presents supportive evidence that economic growth in SSA is dependent on the included variables, explained by 0.95 percent, i.e. 95% by the explanatory variables. In column 3(random effects) of the table, random effects regression reveals that the variables of geography and climate, the focused variables is negative and insignificant. This implies that geography and climate affects economic growth negatively as hypothesized. The same outcome is applicable to some of the key control variables-credit to the private sectors, inflation rate, external debt to GDP ratio and unemployment. However, TFP, HDI index, and trade openness reveals positive relationships with economic growth in SSA countries within the reviewing period. Most importantly, competitiveness variable proxy by TFP and HDI index, holding constant exchange rate and trade openness in both the fixed and random effects appears to be the more important variables in sustaining GDP in SSA. Thus, human development is not only the basis and the pivot of competitiveness, but also the engine of economic growth in SSA and Africa in general.

From the fixed and random effects results, credit to the private sector appears negative contrary to our expectation. The finding coheres with the earlier findings of Arezki and Glyfason(2011), that shows that credit to the private sector has a largely insignificant effect on economic growth. Others similar studies include Allen and Ndikumana(2000) and Loayza and Ranciere(2006) that have all reported the negative relationship between credit to the private sector and economic growth. In addition, the inflation rate variable is consistently negative and insignificant in the fixed and random effects models of our economic growth equation. The negative sign of inflation rate variable confirms our prior expectation. A plausible explanation for this result could be the macroeconomic instability in most sub-Saharan Africa. This result supports the findings of Abou-Ali and Kheir-El-Din(2009) who equally revealed negative relationship between economic growth and inflation rate. By implication, the effects of macroeconomic reforms in SSA on economic growth appear to be limited. For example, a 1% reduction in inflation rate increases economic growth by 0.05% in the fixed effects and 0.05% in the random effects.

The coefficient of the exchange rate dynamics is negative from the regression result in columns 1 and 2. This conforms to our prior expectation. This implies that exchange rate dynamics in SSA has a negative relationship with economic growth. The mismanagement of macroeconomic policies (monetary, fiscal and

exchange rate) in SSA countries has led to substantial depreciation and the devaluation of the domestic currencies vis-à-vis, the trading currencies. This has a damaging effect on the economic performances of SSA since it decreases the profitability of production of tradable (Babatunde, 2009). In addition, a 1% reduction in exchange rate devaluation raises economic growth by 0.250% in the fixed effects regression and 0.115% in the random effects.

The results of the Arelland-Bover/Blundel-Bond system GMM estimation process are presented in Table 3. The results show that the Sargan test of overidentification restriction is satisfactory, as shown by the Arelland-Bond test for AR (2) errors.

Table 3: Difference GMM Dynamic Panel Data Estimator for Economic Growth in Sub-Saharan Africa

Variables	Coefficient	t-value
Constant	-21.214	-1.78**
GDP index	8.687	1.23**
Land locked	-0.951	-2.38***
Malaria	-0.054	-3.72***
Competitive index	0.005	2.78
HDI index	0.042	2.58**
Government expenditure	-0.099	-2.67***
Electricity	0.044	2.58**
Resource boom	-1.080	-1.56**
Population growth	-0.628	-4.24***
Credit to the private sector	-0.002	-3.85***
Inflation rate	-0.008	-0.09
Exchange rate	-0.088	-1.18
Trade openness	-0.233	-0.97
External debt to GDP	-0.182	-1.25
Unemployment	-0.121	-1.53
Time Dummies	Yes	Yes
World test for joint significance Arelland-Bond test for AR(1)	0.000 -1.38(0.015)	
Arelland-Bond test for AR(2)	1.67(0.114)	
Sargan Test for overidentification	37.54(0.426)	

Note: ***(1%) significance level; **(5%) significance level; *(10%) significant level.

Source: Researchers' Computation using WDI (2018) and E-view 9.0

To enhance the robustness of the GMM estimates, we tested the two autocorrelation tests among others diagnostics as required. They are: the first order [AR (1)] and second order [AR(2)] autocorrelation tests which are shown in Table 3 . For the Arellano-Bond GMM estimates to be valid for estimation and policy inference, we expect to reject the null hypothesis for the AR(1) test while we do not expect to reject the null hypothesis for the AR(2). From the difference GMM dynamics estimation, the Arellano-Bond test for AR (1) has value of -1.38(0.015). We therefore, reject AR(1) and accept AR(2) with a value of 1.67(0.14). This implies that the estimates are valid and robust for policy inference. The Sargan test is the second requirement to ensure the validity of our estimates. The Sargan test is for the joint hypothesis of our model specification and the orthogonality condition. From the value of 37.43(0.426), we accept the alternative hypothesis and reject the null hypothesis and concluded that the results are valid and free from unobservable error processes.

V. CONCLUSION AND POLICY IMPLICATIONS

5.1 Conclusion

The central objective of this paper is to determine whether geography is really a key determinant of economic growth in sub-Saharan Africa. We have unlike previous studies, and using cross-country experiences (Uzbekistan, Liechtenstein, Switzerland and Austria, Singapore, South Africa, India etc) shown why geography may not really be a key determinant of economic growth in Africa. Also, we have empirically assessed the impact of key domestic and external drivers of economic growth in sub-Saharan Africa, using the dynamic system GMM method.

Some key findings emerge. First, TFP, human development indicators and trade openness shows positive evidence of relationship with economic growth (GDP index). Second, other explanatory variables show negative relationship with economic growth within the sub-Saharan Africa region in the period under review. Third, the robustness check shows the rejection of the null hypothesis for the AR (1) test while accepting the

alternative hypothesis for AR (2). The Sargan for autocorrelation test also confirmed the robustness of the estimates. The findings of the study are in tandem with a growing recent literature that places whole dynamics of growth and development at the pillars of human development indices. Therefore, the paper recommended among others the building of human capital and regionalism in terms of effective use of human and material resources for fostering and sustaining economic growth in sub-Saharan Africa.

5.2 Policy Implications

Thus far, the authors have shown that after all geography and climate may not be the main driver of economic growth in Africa as variously argued by western development economists. The result shows a positive relationship between economic growth and HDI, TFP. From the analysis, however, African and SSA economies records deteriorating human capital index, poverty and unemployment. This requires accelerated strategies geared towards promoting the economic, social and human resource development of democratic institutions and finding effective solutions to such problems imposed by geography, climate, external debt, food insecurity, disease burden and so on. Increased focus must be on improving human capital which appears to be more important variable in sustaining growth in GDP in SSA. Human capital development is not the only pivot of ensuring competitiveness but also the engine of economic growth in Africa as a whole. Furthermore, the challenges of bad weather and unfavorable environment including poor soil texture can be mitigated through education, irrigation, research and development and so on. Alas, it's human skills that can create improved transport and communication system. In effect, it is human capacity that can endogenize some of the constraints to economic growth in Africa imposed by geography and climate.

VI. LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

A major limitation of the study is that it is based on pooled data thereby limiting its usefulness in terms of application in specific individual countries. Data collection and measurement across the SSA was problematic and limiting. In this way, future studies should focus on specific individual countries. This should give greater specificity to policy guideline

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APPENDIX

List of SSA countries sampled and included in the panel estimation

Angola, Benin, Botswana, Burkina Faso, Cameroon, Cape Verde, Coted'Ivoire, Ethiopia, The Gambia, Ghana, Kenya, Malawi, Mali, Rwanda, Senegal, Sierra Leone, South Africa, Uganda, Zambia, Zimbabwe.

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