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Differences in Colonial Experience and the Institution-Economic Growth Nexus in West Africa

Isiaka Akande Raifu[a], Obianuju Ogochukwu Nnadozie[b] & Olaide Sekinat Opeloyeru[c]

Abstract: *Does the quality of institutions affect economic growth in West African countries? Which institutional variable aids or harms economic growth in the region? Is the effect of institutions on economic growth in former French-colonised countries different from that of British-colonised countries? This study addresses these questions. Specifically, we first examined the effect of six institutional variables on economic growth for each of the 13 West African countries. Then, we employed panel data estimation techniques to examine the overall effect of the quality of institutions on the economies of the region. Finally, we grouped the 13 countries into French-colonised and British-colonised countries following the argument of Acemoglu, Johnson and Robinson (2001, 2005) and then examined the impact of institutional quality on the economic growth of these subgroups. Our findings reveal that the effect of institutional variables on the economy of each country varies. Overall, we find that government stability and democratic accountability have a positive and significant influence on economic growth, while control of corruption and socioeconomic conditions have deleterious effects on economic growth. Finally, institutions contribute positively to economic growth in French-colonised countries compared to British-colonised countries. The results imply that there is a need to strengthen institutions in West Africa, especially in former British colonies.*

Keywords: Institutions; Economic Growth; Ordinary Least Squares; Panel Estimation Methods.
JEL Classification: O43, C23

[a] Corresponding author. Honorary Research Fellow, ILMA University, Karachi, Pakistan. *Email: heritagetiamiyu@gmail.com*
[b] Department of Economics, Faculty of Social Sciences, University of Benin, Edo State, Nigeria. *Email: onwukeme@uniben.edu*
[c] Department of Economics, College of Social and Management Sciences (COSMAS), Tai-Solarin University of Education Ijagun, Ogun State, Nigeria. *Email: dasola2004@gmail.com; opeloyeruos@tasued.edu.ng*

1. Introduction

Different parts of the world have experienced remarkable growth in the last two decades. However, there have been variations in growth across regions and even among countries in the same region. With regards to Africa, economic growth over the past two decades has been largely impressive despite the slowdown in the world economy in 2009. Available statistics show that the region's economic growth was 2.1% in 2016. It rose by 1.4% in 2017 and stood at 3.5% in 2018. At the sub-regional level, East Africa's gross domestic product (GDP) growth was 5.7% in 2018, while that of North Africa stood at 4.9%. West Africa was ranked third with GDP growth of about 3.3%, followed by Central Africa at 2.2% and South Africa recorded 1.2% in the same year. Despite the improvement, GDP growth in Africa is still below the target needed to achieve the Sustainable Development Goals (SDGs).

Among West African countries, there are considerable differences in the growth rate. For instance, Nigeria accounts for about 70% of regional GDP mostly coming from oil production, while Cote d'Ivoire and Ghana contribute about 11% of regional GDP. Finding plausible reasons for divergences in economic growth and cross-country income differences have been the major focus of economists for decades with the key question being: *why do some countries prosper more than others*? In a bid to find answers to this important question, several theoretical and empirical research projects have been carried out with various findings highlighting savings rates and capital per worker (Solow, 1956), consumer preferences (Cass, 1965; Koopmans, 1965), physical and human capital accumulation (Romer, 1986; Lucas, 1988), innovation and technological progress (Romer, 1990; Grossman & Helpman, 1991; Aghion & Howitt 1992). The aforementioned variables are now largely regarded as the proximate determinants of economic growth and cross-country income differences (Acemoglu, Johnson & Robinson, 2001).

North and Thomas, pioneers of the New Institution school of thought, noted that the above-mentioned rationales for divergences in income growth are merely proxies for growth and not the causes of growth. To them, the comparative differences in growth across countries are fundamentally rooted in differences in institutions. Similarly, Acemoglu et al. (2001) identify institutions as the potential fundamental cause of economic growth and

differences in cross-country income. Institutions refer to a set of rules, compliance procedures, moral and ethical behavioural norms designed to constrain the behaviour of individuals in the interest of maximising the wealth and utility of principals (North, 1981). They are the humanly devised constraints that shape human interaction, and thus structure incentives in human exchange whether political, social or economic (North, 1990).

The idea that institutions are crucial to economic performance is not new. Economic history reveals that it dates back at least to Adam Smith with renewed attention aimed at providing empirical evidence (Romer, 2012). Certainly, institutions encourage innovative investment and productive activities by creating incentives for the accumulation of physical and human capital as well as preventing predatory and rent-seeking activities which promote the diversion of resources.

Since the series of North's works[1] on institutions, the empirical literature on its role in engendering economic growth has been on the increase but less so in the context of West Africa. Besides, empirical findings are largely mixed. This study, therefore, takes a deeper look at the institutions-economic growth nexus from the following viewpoints. First, we examine the effect of six institutional variables on economic growth in 13 West African countries[2] using the Ordinary Least Squares (OLS) estimation method. Second, we pool the countries together in a panel setting and then investigate the impact of institutions on economic growth in West Africa using Panel Fixed Effects and Random Effects estimation method. Third, following the argument that colonial structures influence institutions and, consequently, have implications for long-term economic growth and development (Acemoglu, Johnson & Robinson, 2001; 2005); we split the selected 13 countries into French-colonised and British-colonised countries and examine the effect of institutions on economic growth for each group. In essence, the study contributes to the literature by examining whether the link between institutions and economic growth is contingent on differences in the colonial experience, especially in the context of Africa.

Our findings suggest that the effect of institutions on economic growth is context specific. Overall, we find that government stability and democratic accountability have a positive and significant influence on economic growth, but the effect of law and order and the quality of bureaucracy are statistically insignificant. In addition, control of corruption and socioeconomic conditions exercise depressing effects on economic growth. Finally, institutions

contribute positively to economic growth in French-colonised countries compared to British-colonised countries.

The rest of the paper is structured as follows. Section 2 documents the review of existing literature, section 3 contains methodology, data sources and description, while section 4 presents the estimated results and discussion. The final section concludes and offers policy recommendations.

2. Literature Review

The centrality of institutions in the economic growth equation has been underscored in the literature, although the role of institutions was ignored in traditional growth theories until modern theories of growth began to develop. One of the traditional theories – the classical theory – postulates that the growth rate of a country's national income comes from the combined effect of labour growth and increases in productivity (Domar, 1946). A modification of this theory is referred to as neoclassical growth theory developed by Solow (1956). The neoclassical theory opines that factors like population, savings and technological progress influence output per worker. However, only technological progress affects long-run growth, others have a level effect – that is, they only change the level of output per worker at any point in time. Romer (1986) and Lucas (1988) posit that physical and human capital accumulation were major drivers of growth, while Romer (1990), Grossman and Helpman (1991), Aghion and Howitt (1992) further corroborated that intellectual capital and progress in technology determine economic growth.

Recent work on the role of institutions in economic growth suggests that the rules of behaviour in the form of legal frameworks or religion can cause variations in economic growth (North, 1991; Acemoglu et al., 2001). It has been increasingly recognised that institutions influence the incentives to accumulate and innovate. Romer (2010) averred in his theoretical review that changes in institutional rules affect research and development (innovative activities) and because of the relationship between innovation and economic growth, institutional rules may have an impact on economic growth.

On the methodological front, various techniques have been utilised. For instance, Prochazka and Cermakova (2015) applied correlation for a single country over a short period of five years. Knack and Kreefer (1995) assert that the OLS is more appropriate for a single country analysis compared to

correlation. For cross-country or regional analysis, studies like Flachaire et al. (2014); Young and Sheehan (2014); Eicher and Luekert (2009) adopted panel OLS and Two-Stage Least Squares (2SLS) methods to account for endogeneity, while other studies (Siddiqui & Ahmed, 2013; Wang, 2013; Nawaz, 2015; Matthew & Adeboye, 2014; Bonnal & Yaya, 2015) employed dynamic Generalised Method of Moments (GMM) to check the dynamic effect of past economic growth performance on current growth. Some other methods employed by extant studies to account for feedback mechanisms and assessment of wellbeing include causality tests, Hurlin and Venet Granger causality, threshold methods and probit (Law, Lim & Ismail, 2013; Law, Azman-Saini & Ibrahim, 2013; Siti & Podivinsky, 2014; Bonnal & Yaya, 2015).

Also, different proxies have been used to measure the quality of institutions. They include institution and policy rent, index of political institution, institution indices, democracy scores, checks and balances scores, civil liberty scores, control of corruption, law and order, democracy accountability, bureaucratic quality, government effectiveness, executive recruitment, legislative and executive indices of electoral competitiveness to contract enforcement and expropriation risks, yet virtually all the studies found the quality of institutions to have a significant positive effect on economic growth. For instance, Knack and Keefer (1995) found a positive relationship between property rights, investment and economic growth. Other studies with similar empirical results, though with different sources of institutional variables include Eicher and Luekert (2009); Siddiqui and Ahmed (2013); Flachaire, Garcia-Penalosa and Konte (2014); Wang (2013); Young and Sheehan (2014); Nawaz (2015); Matthew and Adegboye (2014).

On the empirical front, the literature on the nexus between institutions and economic growth has produced mixed findings. For instance, employing panel OLS and GMM-based estimation with data from 84 countries, Siddiqui and Ahmed (2013) find that institutions exert a large and positive influence on economic growth. Similarly, the empirical results of Nawaz (2015) obtained by applying fixed effects and system GMM to panel data for 56 countries over the period 1981 to 2010 give credence to the assertion that institutions matter for economic growth. Also, the findings show that the impact of institutions on economic growth is contingent on the level of development. Specifically, the positive impact of control over corruption, qualitative and effective bureaucracy and desirable law and order conditions on economic growth is greater in high-income countries compared to low-income countries.

Also, Nguyen, Su and Nguyen (2018) obtain similar results using the system GMM technique and data for 29 emerging economies for the period 2002 to 2015. In particular, the authors show that institutional quality fosters economic growth on the one hand and modulates the effect of foreign direct investment (FDI) and trade openness on the other. In the same vein, Salman et al. (2019) find that institutional quality can simultaneously stimulate economic growth and reduce the emissions of carbon utilising a panel of three East Asian countries over the period from 1990 to 2016.

On the contrary, the empirical findings of Bonnal and Yaya (2015) using a panel of over 200 countries for the period 1975 to 2010 indicate that there is weak evidence of a relationship between the quality of political institutions and economic growth. In particular, most of the indicators of political institutions employed have no significant association with economic growth. Likewise, investigating the relationship between institutional quality and economic growth in six countries (Cameroon, Congo, Central African Republic, Gabon, Equatorial Guinea and Chad) in the Central African Economic and Monetary Community (CEMAC) zone, the empirical result of Seppo (2020) reveals that there is no evidence that institutional quality significantly affects economic growth in the zone. Specifically, voice and accountability, government effectiveness, regulatory quality, rule of law and control of corruption had an insignificant impact on economic growth, while political stability positively and significantly affects growth in the zone.

Employing the tool of spatial econometrics, Ganau (2017) analysed the role of institutional factors – democracy, legislature effectiveness and political/regime instability – in driving short-run economic growth in a sample of 50 African countries with data spanning 1981 to 2001. The author finds that democracy and regime instability have deleterious effects on economic growth, while legislature effectiveness spurs growth. In addition, the paper highlights the influence of neighbouring countries' institutional settings on growth in the home country. Specifically, the empirical results reveal that a high level of democracy in neighbouring countries engenders growth, while the legislative effectiveness in contiguous countries has a negligible effect on the short-run growth in the home country.

On the causality results between institutions and economic growth, Siti and Podivinsky (2014) found that causality from institutions to growth dominates that from growth to institutions. Law et al. (2013) found a bi-directional relationship between institutions and economic development.

They further stated that the relationship is varied among the 66 countries investigated, which is noted to be as a result of different states of income level. It should, however, be noted that despite the burgeoning literature on the growth effects of institutions, none of them to the best of our knowledge have empirically investigated the long-run relationship between institutions and economic growth, especially between the French-colonised countries and the British-colonised countries. This is the gap that this study attempts to fill.

3. Theoretical Framework and Methodology

3.1 Theoretical framework

The theoretical framework we employ in this study is the Augmented Solow Growth Model by Mankiw, Romer and Weil (1992). The model is a Cobb-Douglas production function which is specified as:

$$Y(t) = K(t)^{\alpha} H(t)^{\beta} (A(t)L(t))^{(1-\alpha-\beta)}, \ \alpha + \beta < 1 \tag{1}$$

where Y is output, K is physical capital, H is human capital, L is labour, A is the level of technology and it is assumed that $\alpha + \beta < 1$, which means that there is decreasing returns to scale. Both L(t) and A(t) are also assumed to be growing exogenously at the rate of n and g respectively.

Dividing equation (1) by A(t)L(t) with some computations will yield output per unit of effective labour and the resultant steady-state equations as follows:

$$\dot{k} = s_k y(t) - (n + g + \delta)k(t) \tag{2}$$

$$\dot{h} = s_k y(t) - (n + g + \delta)h(t) \tag{3}$$

where y = Y/AL, k = K/AL and h = H/AL are applied to arrive at equations (2) and (3) and they are known as quantities per unit of effective labour.

By simple manipulation of equations (2) and (3), we obtain expressions for k and h respectively. Substituting them back to equation (1) and then taking the log will yield:

$$\ln\left(\frac{Y(t)}{L(t)}\right) = \ln A(0) + gt - \frac{\alpha+\beta}{1-\alpha+\beta}\ln(n+g+\delta) + \frac{\alpha}{1-\alpha-\beta}\ln(s_k) + \frac{\beta}{1-\alpha-\beta}\ln(s_h) \quad (4)$$

Equation 4 above shows that per capita income depends on population growth and the accumulation of physical and human capital.

According to Aron (1997), there are three ways[3] by which institutions can be incorporated into the equation (4). However, this study adopts one of those methods, which is through A(0). A(0) does not only show technology but also all other factors, such as resources endowments, institutions and so on.

Based on equation (4), the model for this study is specified as

$$\Delta y_{i,t} = \alpha_0 + \gamma I_{i,t} + \beta \sum_{i=1}^{n} X_{i,t} + \varepsilon_{i,t} \quad (5)$$

where $\Delta y_{i,t}$ denotes the growth rate of output of country i at time t, which is captured by per capita GDP growth rate, $I_{i,t}$ stands for quality of institutions in country i at time t, $X_{i,t}$ is the matrix of control variables, while $\varepsilon_{i,t}$ represents the error term. The vector of control variables includes trade openness, population growth rate, government consumption expenditure, gross fixed capital formation and consumer price index.

The model is formally specified in panel form as follows:

$$rgdp_{it} = \alpha_0 + \alpha_1 inst_{it} + \alpha_2 cpi_{it} + \alpha_3 gce_{it} + \alpha_4 gfcf_{it} + \alpha_5 pgr_{it} + \alpha_6 tropen_{it} + \varepsilon_{it} \quad (6)$$

where *rgdp* is the real GDP, *inst* denotes the quality of institutions, *cpi* is the consumer price index representing inflation rate, *gce* is final government consumption expenditure, *gfcf* is the gross fixed capital investment – a proxy for investment, *pgr* is the population growth rate, *tropen* is trade openness and ε is an error term assumed to be normally distributed with zero mean and constant variance.

A priori, inflation is expected to have either a positive or negative effect on the economy. Theoretically, the Mundell-Tobin effect anchored on the Neoclassical growth model suggests that a positive relationship can exist between inflation and economic growth. The intuition behind this is that inflation rate can lead to an increase in the nominal interest rate, which encourages a shift from consumption to investment. The increased investment will in turn raise economic growth (Mundell, 1963; Tobin,

1965). Conversely, Stockman's (1981) cash in advance model suggests that a negative relationship exists between inflation and economic growth.

In the case of government expenditure, the Keynesian school of thought posits that a positive relationship exists between government expenditure and economic growth, other things being equal. However, models in the neoclassical growth framework mostly conclude that government expenditure has a level effect but not a growth effect (Devarajan, Swaroop & Zou, 1996). Again, the crowding-out effect of government spending suggests that it could be inimical to economic growth. Therefore, the effect of government consumption expenditure on the economy is ambiguous.

With respect to gross fixed capital formation, a proxy for investment, a positive relationship is expected to hold between investment and economic growth (Barro, 1990). The theoretical prediction on the effect of population growth on economic growth continues to be controversial. While it is often cited that population growth negatively impacts the economy, there are reasons to believe that it can be a blessing if properly utilised. Kremer (1993) affirms that almost all endogenous growth models predict that a larger population implies that there are more people available to develop innovative ideas that would spur growth. Overall, it is expected that the effect of population growth on economic growth can either be positive or negative.

For trade openness, the theoretical link on its relationship with economic growth is mixed. One strand of the theory suggests that trade can boost economic growth when a country specialises in the production of the goods in which it has absolute and/or comparative advantage. The economies of scale in that sector of specialisation would spur productivity and economic growth (Krueger, 1978; Bhagwati, 1978). Also, trade can contribute positively to economic growth by facilitating technological innovation and diffusion (Romer, 1994). However, another strand of the literature stipulates that trade openness may not be beneficial to developing countries due to inadequate or limited infrastructural, institutional and financial capacities to absorb, adopt and adapt imported technology. Besides, the gains from trade openness depend on whether or not the comparative advantage and resources in developing countries are devoted to sectors that promote economic growth in the long run (Grossman & Helpman, 1991; Redding, 1999). Thus, trade openness could have a positive or negative effect on economic growth.

3.2 Data sources and description

This study employs panel data for 13 West African countries[4] for the period 1984 to 2016. Our choice of countries and the sample period is guided by data availability as the selected countries are the 13 West African countries included in the World Governance Indicator obtained from International Country Risk Guide (www.prsgroup.com). The data set is further grouped into two based on whether the country has been colonised by Britain or France. This comprises seven French-speaking countries and four British English-speaking countries. The reason for this is the basic conjecture that the current institutional structure of a country depends on the institutions its colonial master left behind (Acemoglu et al., 2001).

Six variables of institutional quality are used. They include government stability, socioeconomic condition, control over corruption, democratic accountability, rule of law and bureaucratic quality (government effectiveness). Other control variables which have been used extensively in the literature – consumer price index (CPI), government consumption expenditure, gross fixed capital formation, population growth and trade openness, as well as data on real GDP, were sourced from the World Development Indicators (2014). Real GDP is measured at constant US dollars in 2000 for uniformity.

Table 1 below explains the conceptual definition of the institutional variables used in the analysis and its range.

4. Empirical Results

4.1. Summary statistic results

Table 2 presents the summary statistics of the overall data used for the 13 countries in terms of mean, standard deviation, minimum and maximum values. Overall, the average real GDP is $23.9 billion, government consumption in the region averages at $13.033 billion, the population grows at an average of 2.7%, trade openness accounts for an average of 65.3% and the average gross fixed capital is $17.23 billion. Among the 13 countries, Nigeria recorded the highest average real GDP of $0.23 trillion while Gambia recorded the lowest average real GDP (see Appendix Table A1).

Table 1: Definition of Institutional Indicators and Scoring Ranges

Indicators	Conceptual Definitions
Government stability is made up of three subcomponents, which include government unity – 4 points, legislative strength – 4 points and popular support – 4 points, totalling 12 points	Government stability involves the assessment of the government's ability to carry out its declared programmes and its ability to stay in office. For each subcomponent, the maximum score is 4 points, while the minimum is 0 points. A score of 4 points implies a very low risk and a score of 0 points denotes a very high risk.
Socioeconomic conditions comprise three subcomponents, which include unemployment – 4 points, consumer confidence – 4 points and poverty – 4 points, totalling 12 points	Socioeconomic conditions entail the assessment of socioeconomic pressures at work in the society that could constrain the government's action or fuel social dissatisfaction. For each subcomponent, the maximum score is 4 points, while the minimum score is 0 points. A score of 4 implies a very low risk and a score of 0 denotes a very high risk.
Control of corruption (6 points)	This assesses the level of corruption within the political structure or system. Corruption can cause distortions in the economic and financial system, reduce the efficiency of the public and private sector by enabling the people to hold the position of power based on patronage and rent seeking rather than ingenuity, ability and capability and thus creates instability in the political system. It ranges between 0 (very high corruption) and 6 (very low corruption).
Democratic accountability (6 points)	Democratic accountability measures how the government is responsible to its people. The score is assigned by the categorisation of the system of government. The highest number of risk points (lowest risk) is assigned to Alternating Democracies, while the lowest number of risk points (highest risk) is assigned to Autarchies.
Rule of law (Law and Order)	Law and order is an assessment of the strength and impartiality of the legal system as well as the public observance of the law. It ranges from 0 (very high risk) to 6 (very low risk).
Government effectiveness (Bureaucratic Quality)	This assesses the strength and expertise of bureaucracy to govern independently and to be autonomous from political pressure. It ranges between 0 (very low bureaucratic quality) and 4 (very high bureaucratic quality).

Source: The Political Risk Services Group – International Country Risk Guide Methodology.

The results show that most of the institutional variables are moderately low in the West African region. For instance, government stability ranges from 1.00 to 11.00 with a mean of 7.11 and a standard deviation of 2.29. Similarly, rule of law has a minimum of 0.75 and a maximum of 5.00 with a mean of 2.46, while control of corruption has a minimum of 0 and maximum of 4.00 with a mean of 2.21. One would have thought that a country like Nigeria, with the highest average real GDP, would have had stronger institutional variables than other countries but the reverse is the case. As shown in Appendix Table A1, the average government stability for Nigeria is less than 7.00, while countries like Burkina Faso, Gambia, Ghana, Guinea, Mali, Sierra Leone and Togo recorded average government stability of more than 7.00. The level of control of corruption among these countries is weak. The result shows that less than half of these countries recorded more than 2.00 points as an average for control of corruption, while more than half recorded less than 2.00 points.

Table 2: Summary Statistics

Variables	Obs.	Mean	Standard Deviation	Minimum	Maximum
Real GDP (rgdp)	427	2.39e+10	6.79e+10	2.40e+08	4.64e+11
Government Stability (gsta)	422	7.11	2.29	1.00	11.00
Control of Corruption (corr)	422	2.21	0.82	0.00	4.00
Rule of Law (lao)	422	2.65	0.82	0.75	5.00
Democratic Accountability (dem)	422	2.80	1.28	0.00	5.50
Bureaucratic Quality (bucrt)	422	1.20	0.92	0.00	3.00
Socioeconomic Condition (sec)	422	3.97	1.56	1.00	8.00
Consumer Price Index (cpi)	363	72.38	37.94	0.50	206.69
Government Consumption Expenditure (gce)	413	13.03	4.83	0.00	54.52
Gross Fixed Capital Formation (gfcf)	410	17.23	7.51	-2.42	51.46
Population Growth (popgr)	429	2.74	1.01	-1.84	7.85
Trade Openness (opnes)	417	65.30	31.43	18.81	311.36

Source: Computed by the authors.

4.2. Correlation analysis results

In Table 3, the results of the correlation analysis among the variables are presented. Closer scrutiny of the table indicates that most of the institutional variables are positively correlated with the log of real GDP except for control of corruption and rule of law that are negatively correlated with log of real GDP. However, the correlation coefficients for the two variables are not statistically significant. Similarly, population growth, log of trade openness as well as log of gross fixed capital appear to be negatively correlated and statistically insignificant with log of real GDP. Government consumption expenditure and consumer price index, however, are negatively and significantly associated with log of real GDP. A cursory look at the table also shows that there is no problem of multicollinearity among the regressors since the correlation coefficients are very low.

4.3. Im-Pesaran-Shin unit root test results

A summary of panel unit root test results is reported in Table 4. The Im-Pesaran-Shin (Im, Pesaran & Shin, 2003) unit root test used for this study is based on the null hypothesis that each series in the panel contains a unit root against the alternative that some of the individual series have a unit root while others do not. If the unit root results show that the variables are not statistically significant at levels, then it implies that the variables are not stationary. Consequently, the null hypothesis of no stationarity is upheld. This means that the variables need to be first differenced before they can be stationary. The results as presented in Table 4 show that institutional variables are not stationary at level but they are stationary at first difference. This suggests that the variables are integrated of order 1. The log of the consumer price index, trade openness, gross fixed capital and government consumption expenditure are stationary at levels or integrated of order 0. In other words, the variables do not trend over time.

Table 3: Pairwise Correlation Results

Variables	lrgdp	gsta	corr	lao	dem	bucrt	sec	lcpi	lgce	lgfcf	popgr	lopnes
lrgdp	1.000											
gsta	0.135*	1.000										
corr	-0.064	0.009	1.000									
lao	-0.089	0.327*	0.429*	1.000								
dem	0.125*	0.337*	0.051	0.256*	1.000							
bucrt	0.163*	-0.094	0.438*	0.231*	0.128*	1.000						
sec	0.061	-0.144*	0.526*	0.228*	-0.074	0.528*	1.000					
lcpi	-0.117*	0.332*	-0.140*	0.332*	0.350*	-0.194*	-0.415*	1.000				
lgce	-0.120*	-0.109*	0.088	0.168*	0.026	-0.090	0.194*	0.199*	1.000			
lgfcf	-0.042	0.030	-0.023	-0.108*	0.059	-0.020	0.118*	0.114*	0.191*	1.000		
popgr	-0.019	0.261*	0.304*	0.229*	0.332*	0.132*	0.163*	-0.013	0.172*	0.130*	1.000	
lopnes	-0.089	0.157*	-0.059	0.033	0.118*	-0.120*	-0.113*	0.262*	0.048	0.244*	0.035	1.000

Source: Computed by the authors.

Note: * shows significance at the 0.05 level. All variables are as previously defined and when "l" precedes any of the variables, it means that the variable is naturally logged.

Table 4: Panel Unit Root Test Results

Variables	Im-Pesaran-Shin (2003)	
	Level	**First difference**
Government Stability (gsta)	-1.553 (0.3784)	-4.112*** (0.0000)
Control of Corruption (corr)	-1.202 (0.9034)	-4.742*** (0.0000)
Rule of Law (lao)	1.500 (0.4758)	-4.292*** (0.0000)
Democratic Accountability (dem)	-1.439 (0.5738)	-4.150*** (0.0000)
Socioeconomic Condition (sec)	-1.602 (0.4875)	-4.372*** (0.0000)
Log of Real GDP (lrgdp)	0.564 (1.0000)	-5.066*** (0.0000)
Log of Consumer Price Index (lcpi)	-2.488** (0.0190)	-3.409*** (0.0000)
Log of Trade Openess (lopnes)	-2.030** (0.0391)	-6.016*** (0.0000)
Log of Gross Fixed Capital (lgfcf)	-2.578** (0.0196)	-7.895*** (0.0000)
Log of Government Consumption Expenditure (lgce)	-2.835*** (0.0000)	-6.625*** (0.0000)
Population Growth (popgr)	-9.768*** (0.0000)	-11.637*** (0.0000)

Note: *,** and *** represent 10%, 5% and 1% significant levels respectively.

Source: Computed by the authors.

4.4 OLS estimation results

The results of OLS estimation show the effects of various institutional variables on the economic growth in each of the West African countries considered. The summary of the results is presented in Table 5, the full regression results are in the appendix, Table 2A-7A. We begin the interpretation by looking at the effect of government stability on economic growth. As shown in Table 5, the impact of government stability on economic growth varies across the countries under consideration. Summarily, government stability has a positive effect on the economic growth of

countries like Cote d'Ivoire, Gambia, Guinea, Liberia, Senegal, Sierra Leone and Togo. However, the effect is only statistically significant in Guinea and Togo at 10% and 1% respectively. Conversely, we find that government stability has a negative significant effect on the economies of Burkina Faso, Ghana, Guinea-Bissau and Mali. Even though the impact of government stability on economic growth in Nigeria is negative, it is, however, not statistically significant.

In countries where government stability exerts a negative effect on their economies, history shows that these countries have been characterised by high political instability although most of them are currently under democratic governments. For instance, Sierra Leone, Liberia and Nigeria, as well as others, have experienced military and counter-military coups and even after embracing a democratic system of government, power transition among political elites has not always been seamless. Almost every election period has witnessed some level of violence orchestrated by political gladiators.

The impact of corruption on economic growth varies in each of the countries of West Africa considered. The positive effects of corruption on economic growth are found in countries such as Burkina Faso, Ghana, Liberia, Niger and Togo. However, the positive effect is only statistically significant in Niger. In countries like Cote d'Ivoire, Gambia, Guinea, Guinea-Bissau, Mali, Nigeria, Senegal and Sierra Leone, corruption appears to be having a devastating impact on economic growth. The effect is statistically significant in countries like Cote d'Ivoire, Guinea, Guinea-Bissau, Senegal and Sierra Leone. From this finding, it is evident that corruption is endemic in most of the countries in West Africa. Even in countries where corruption has a positive effect on their economy, it is not statistically significant. The mixed empirical finding is in tandem with the extant literature. While some studies have documented that corruption greases the wheel of the economy (Acemoglu & Verdier, 1998; Meon & Weill, 2010), others reveal that corruption can hurt the economy (Mo, 2001, Grundler & Potrafke, 2019).

Evidence from Table 5 also shows that rule of law has diverse effects on economic growth across West Africa. In countries like Burkina Faso, Cote d'Ivoire, Ghana, Guinea, Guinea-Bissau, Mali, Niger, Nigeria and Togo, rule of law has a negative effect on the economy. In fact, the negative effect is statistically significant in Burkina Faso, Ghana, Guinea and Mali. In contrast,

the rule of law has a positive and statistically significant effect on economic growth in Liberia and Sierra Leone. As suggested by North (1990) ensuring the security of property rights and enforcement of contracts are precursors to long-term economic growth (see also, Haggard, Macintyre & Tiede, 2008).

From Table 5, it can be observed that democratic accountability contributes positively and significantly to economic growth in Burkina Faso, Guinea and Sierra Leone. On the contrary, democratic accountability negatively affects the economies of countries such as Cote d'Ivoire, Gambia, Guinea-Bissau, Mali, Niger, Senegal and Togo. In addition, our results show that there is a positive relationship between bureaucratic quality and economic growth in Gambia, Guinea, Niger and Nigeria although the effect is only statistically significant in Guinea and Niger. Similarly, socioeconomic condition exerts a positive and significant effect on economic growth in Guinea, Guinea-Bissau, Liberia, Niger, Nigeria and Sierra Leone. However, the positive significant effect occurs in Guinea and Liberia. Conversely, bureaucratic quality influences negatively on economic growth in Burkina Faso, Cote d'Ivoire, Ghana, Guinea-Bissau, Senegal and Togo while socioeconomic condition has a negative impact on the economies of Burkina Faso, Cote d'Ivoire, Gambia, Ghana, Mali, Senegal and Togo.

4.5 Effect of institutions on economic growth in West Africa

We now turn to explain the impact of each of the institutional variables on the economic growth of West Africa as a whole. In this regard, we estimate both the fixed effects and random effects panel regression. We also use the Hausman specification test to ascertain the choice between the fixed effects and random effects. The null hypothesis of the Hausman specification test is that one of the models to be compared, say fixed effects, yields consistent and efficient outcomes and the other, say random effects, consistent but not efficient. This null hypothesis is usually tested against the alternative hypothesis, which stipulates that the fixed effects yield inconsistent results and the random effects are consistent (Sheytanova, 2014). If the Hausman Chi-square test is statistically significant at 5%, then fixed effects is consistent and then interpreted, otherwise random effects is interpreted. The results of the Hausman test reveal that random effect is a consistent model to explain because the Hausman test results are not statistically significant in all the models.

Table 5: Effect of Institutions on Economic Growth

Variables	Burkina_ Faso	Cote_ d'Ivoire	The Gambia	Ghana	Guinea	Guinea-Bissau	Liberia	Mali	Niger	Nigeria	Senegal	Sierra_ Leone	Togo
gsta	-0.027*	0.011	0.009	-0.046***	0.060*	-0.045**	0.092	-0.058***	-0.040***	-0.002	0.007	0.010	0.029***
	(0.016)	(0.007)	(0.005)	(0.011)	(0.031)	(0.017)	(0.084)	(0.016)	(0.012)	(0.016)	(0.009)	(0.011)	(0.009)
corr	0.057	-0.057***	-0.029	0.038	-0.238*	-0.238***	0.431	-0.083	0.062**	-0.006	-0.142**	-0.127***	0.047
	(0.068)	(0.020)	(0.035)	(0.027)	(0.125)	(0.054)	(0.265)	(0.052)	(0.027)	(0.066)	(0.067)	(0.042)	(0.075)
lao	-0.261***	-0.004	0.018	-0.068*	-0.676***	-0.021	1.278***	-0.285***	-0.017	-0.025	0.191	0.164**	-0.080
	(0.049)	(0.037)	(0.023)	(0.038)	(0.158)	(0.033)	(0.152)	(0.100)	(0.105)	(0.043)	(0.120)	(0.065)	(0.084)
dem	0.090***	-0.034	-0.003	0.034	0.265***	-0.021	0.103	-0.151***	-0.043**	-0.001	-0.016	0.060***	-0.061*
	(0.032)	(0.030)	(0.014)	(0.038)	(0.055)	(0.018)	(0.153)	(0.035)	(0.018)	(0.029)	(0.019)	(0.016)	(0.031)
bucrt	-0.080	-0.067***	0.027	-0.021	0.371***	-0.029	-	-	0.126*	0.001	-0.183***	-0.012	-0.123**
	(0.093)	(0.011)	(0.056)	(0.033)	(0.051)	(0.157)	-	-	(0.069)	(0.036)	(0.051)	(0.038)	(0.046)
sec	-0.022	-0.010	-0.017	-0.009	0.273***	0.060	0.367***	-0.183***	0.075	0.014	-0.037	0.010	-0.009
	(0.036)	(0.007)	(0.018)	(0.015)	(0.094)	(0.036)	(0.103)	(0.063)	(0.048)	(0.019)	(0.028)	(0.036)	(0.016)

Notes: Standard errors are in parenthesis. *** p<0.01, ** p<0.05, * p<0.1

As reported in Table 6, the impact of each of the institutional variables on economic growth varies in terms of the sign and significance of the estimated coefficients. The overall results show that government stability, rule of law and democratic accountability have positive effects on economic growth, albeit the coefficient of rule of law is not statistically significant. The results suggest that government stability and democratic accountability are indispensable to the economic growth of West African countries. Several studies have shown that the stability of political systems, transparency and accountability in discharging a government's duties are prerequisites for economic growth (De Haan & Siermann, 1996; Benhabib & Przeworski, 2005; Ramadhan et al., 2016). Haan & Siermann (1996) opine that political stability remains an indispensable condition for the optimal functioning of the economy. Benhabib & Przeworski (2005) argue that if political office holders are concerned with the welfare of their citizens without any ulterior motive, the economy is likely to grow at an annual rate of 0.030 per annum. In Tunisia, Ramadhan et al. (2016) find a positive connection between political stability and economic growth.

On the other hand, control of corruption, socioeconomic condition and bureaucratic quality have a negative and significant effect on economic growth. Specifically, the results suggest that a high rate of corruption, bureaucratic bottlenecks and bad economic conditions can retard economic growth by 0.116%, 0.099% and 0.087% respectively. A critical examination of the coefficient estimates shows that the negative effect of corruption on economic growth is higher than the negative impact of other institutional variables. Although the literature remains unsettled with regards to the effect of corruption on economic growth, there are ample empirical studies that conclude that corruption is detrimental to economic growth across the world (Wei, 2000; Mo, 2001; Gründler & Potrafke, 2019). In Africa, Godsmith (1999) posits that the underdevelopment of many African countries can be attributed to the quality of bureaucracy. In a country characterised by the low quality of bureaucracy or cumbersome bureaucratic processes such as red-tapism or excessive regulations, the personal pursuit of bureaucrats can supersede overall economic growth and the development agenda (Gailmard & Patty, 2012).

Table 6: Panel Regression Results of Effects of Institutional Variables on Economic Growth in West Africa

	Fixed Effects	Random Effects	Fixed Effects	Random Effects	Fixed Effects	Random Effects	Fixed Effects	Random Effects	Fixed Effects	Random Effects	Fixed Effects	Random Effects
	lrgdp	Lrgdp	lrgdp	lrgdp	lrgdp	lrgdp	lrgdp	lrgdp	lrgdp	lrgdp	lrgdp	lrgdp
gsta	0.016**	0.016**										
	(0.007)	(0.007)										
corr			-0.116***	-0.116***								
			(0.019)	(0.019)								
lao					0.002	0.001						
					(0.022)	(0.022)						
dem							0.038***	0.038***				
							(0.013)	(0.013)				
bucrt									-0.100***	-0.099***		
									(0.018)	(0.018)		
sec											-0.087***	-0.087***
											(0.010)	(0.010)
lcpi	0.287***	0.286***	0.277***	0.276***	0.298***	0.298***	0.275***	0.275***	0.299***	0.298***	0.241***	0.240***
	(0.015)	(0.015)	(0.014)	(0.014)	(0.014)	(0.014)	(0.016)	(0.016)	(0.013)	(0.013)	(0.014)	(0.014)
lgce	-0.049	-0.049	-0.068	-0.068	-0.072	-0.072	-0.074	-0.075	-0.075	-0.076	-0.021	-0.022
	(0.051)	(0.051)	(0.048)	(0.048)	(0.051)	(0.051)	(0.050)	(0.050)	(0.049)	(0.048)	(0.046)	(0.046)
lgfcf	0.287***	0.287***	0.251***	0.250***	0.284***	0.284***	0.296***	0.295***	0.269***	0.268***	0.280***	0.279***
	(0.033)	(0.033)	(0.032)	(0.032)	(0.035)	(0.035)	(0.033)	(0.033)	(0.032)	(0.032)	(0.030)	(0.030)
popgr	0.087***	0.087***	0.079***	0.079***	0.087***	0.087***	0.054*	0.054*	0.120***	0.119***	0.111***	0.110***
	(0.030)	(0.030)	(0.029)	(0.029)	(0.031)	(0.031)	(0.032)	(0.032)	(0.030)	(0.030)	(0.028)	(0.028)
lopnes	-0.093*	-0.094*	-0.092*	-0.092*	-0.089*	-0.090*	-0.079	-0.079	-0.096**	-0.096**	-0.120***	-0.121***
	(0.050)	(0.050)	(0.048)	(0.048)	(0.051)	(0.050)	(0.050)	(0.050)	(0.048)	(0.048)	(0.046)	(0.046)
Constant	20.744***	20.600***	21.330***	21.186***	20.865***	20.723***	20.872***	20.725***	20.971***	20.821***	21.405***	21.250***
	(0.218)	(0.521)	(0.216)	(0.516)	(0.221)	(0.532)	(0.212)	(0.530)	(0.206)	(0.528)	(0.204)	(0.527)
No. of Obs.	358	358	358	358	358	358	358	358	358	358	358	358
R-squared	0.643	0.643	0.674	0.674	0.637	0.637	0.645	0.645	0.667	0.667	0.701	0.701
Hausman Test	0.79 (0.9924)		0.76 (0.9930)		0.53 (0.9975)		0.40 (0.9989)		0.68 (0.9949)		0.34 (0.9993)	

Notes: Standard errors are in parenthesis. *** p<0.01, ** p<0.05, * p<0.1

4.6 Effect of institutions on economic growth in French and British-colonised West African countries

Following the submission of Acemoglu et al. (2001) that the nature of institutions left behind by the colonial master has implications for its long-term economic growth and development, we examined whether differences in colonial experience influence the institution-growth nexus in West Africa. The countries are grouped into French-colonised and British-colonised West African countries and the pooled panel regression method is employed for the analysis. The results for the former French-colonised countries are presented in Table 7, while those of former British-colonies are presented in Table 8.

From Table 7, it is evident that all the six institutional variables have positive effects on economic growth in the French-colonised countries although government stability is not statistically significant. This may be due to the instability characterising changes from one government to another in the region. In the case of former British-colonised West African countries as reported in Table 8, most of the institutional variables have negative and significant impacts on economic growth; only democratic accountability has a positive and significant effect on economic growth. Specifically, control of corruption, law and order, as well as socio-economic condition, have negative effects on economic growth. This shows the deplorable situation of various institutions saddled with the responsibility of curtailing or curbing the pervasiveness of corruption and ensuring law and order. It also symbolises the existence of worrisome socio-economic conditions – a sign of social distrust in or dissatisfaction with the government's activity.

The summary of our findings is that institutions stimulate or spur economic growth in French-colonised West African countries while they are deleterious to economic growth in the British-colonised West African countries. Our findings are, however, different from the results documented by Grier (1997, 1999). Grier (1997) pools the data of 63 formal-colonial states over the period of 1961 to 1990 and finds that former British-colonised countries performed better, on average than French and Spanish colonised countries. He attributes the differences in developmental experience to the duration of the time spent in the colonies. He then concludes that countries that were under colonisation for a long time perform better than other countries after independence.

Table 7: Effect of Institutional Variables on Economic Growth in French-Colonised Countries

	(1) lrgdp	(2) lrgdp	(3) lrgdp	(4) lrgdp	(5) lrgdp	(6) lrgdp
gsta	0.023					
	(0.027)					
corr		0.272***				
		(0.065)				
lao			0.179**			
			(0.079)			
dem				0.224***		
				(0.052)		
bucrt					0.230***	
					(0.054)	
Sec						0.154***
						(0.044)
lcpi	0.880***	1.237***	0.925***	0.667***	1.188***	1.366***
	(0.170)	(0.162)	(0.151)	(0.160)	(0.157)	(0.190)
lgce	0.539**	0.410**	0.429**	0.668***	0.477**	0.375*
	(0.215)	(0.202)	(0.209)	(0.204)	(0.200)	(0.206)
lgfcf	-0.562***	-0.534***	-0.542***	-0.550***	-0.599***	-0.644***
	(0.143)	(0.138)	(0.142)	(0.137)	(0.138)	(0.141)
popgr	-0.036	0.039	-0.013	-0.213**	-0.144	-0.006
	(0.094)	(0.092)	(0.094)	(0.100)	(0.094)	(0.092)
lopnes	0.501***	0.565***	0.528***	0.726***	0.517***	0.470***
	(0.170)	(0.164)	(0.169)	(0.172)	(0.163)	(0.165)
Constant	16.865***	14.663***	16.401***	16.533***	15.973***	14.989***
	(1.132)	(1.211)	(1.141)	(1.087)	(1.107)	(1.225)
No. of Obs.	204	204	204	204	204	204
R-squared	0.235	0.295	0.252	0.298	0.296	0.278

Notes: Standard errors are in parenthesis. *** p<0.01, ** p<0.05, * p<0.1

Table 8: Effect of Institutional Variables on Economic Growth in British-Colonised Countries

	(1) lrgdp	(2) lrgdp	(3) lrgdp	(4) lrgdp	(5) lrgdp	(6) lrgdp
gsta	0.065					
	(0.078)					
corr		-1.095***				
		(0.255)				
lao			-0.454***			
			(0.173)			
dem				0.332***		
				(0.112)		
bucrt					0.206	
					(0.165)	
sec						-0.202*
						(0.104)
lcpi	-0.365***	-0.428***	-0.214*	-0.485***	-0.314***	-0.457***
	(0.119)	(0.110)	(0.120)	(0.122)	(0.114)	(0.129)
lgce	-1.696***	-1.390***	-1.767***	-1.780***	-1.761***	-1.612***
	(0.501)	(0.475)	(0.479)	(0.477)	(0.487)	(0.492)
lgfcf	-0.771**	-0.753**	-1.046***	-0.681**	-0.785**	-0.770**
	(0.336)	(0.317)	(0.338)	(0.328)	(0.332)	(0.330)
popgr	-0.646**	-0.322	-0.325	-0.820***	-0.652**	-0.492
	(0.299)	(0.296)	(0.319)	(0.299)	(0.299)	(0.307)
lopnes	0.058	0.264	0.171	0.168	0.175	0.097
	(0.420)	(0.393)	(0.404)	(0.402)	(0.411)	(0.408)
Constant	30.725***	31.252***	31.379***	30.618***	30.497***	31.554***
	(1.629)	(1.482)	(1.529)	(1.529)	(1.632)	(1.555)
No. of Obs.	186	186	186	186	186	186
R-squared	0.204	0.275	0.230	0.238	0.207	0.217

Notes: Standard errors are in parenthesis. *** p<0.01, ** p<0.05, * p<0.1

4.7 Effects of other explanatory variables on economic growth

Apart from ascertaining the effects of institutional variables on economic growth, we also control for other explanatory variables in order to examine their influence on economic growth in West Africa. These other explanatory variables are consumer price index (a proxy for inflation rate), government consumption expenditure, gross fixed capital formation (investment), population growth rate and trade openness. Since we include these variables in the individual country's estimation and panel estimations, we would focus on panel estimation results. Then we would interpret and explain the impact of these explanatory variables on economic growth in West Africa as a whole and in the British-colonised countries and the French-colonised countries.

From Table 6 using random effects results, it is evident that consumer price index has a positive and significant impact on economic growth in West Africa. Also, gross fixed capital formation and population growth rate influence economic growth positively and significantly. In specific terms, an increase in inflation rate, investment and population by 1% would spur economic growth by 0.286%, 0.287% and 0.087% respectively. The results suggest that inflation rate, investment and population growth are germane to the growth of the economies of West Africa. From an empirical perspective, Hussain and Malik (2011) find that inflation positively affects economic growth in Pakistan, while Doguwa (2012) concludes that inflation is positively correlated with economic growth at a low level of inflation. In the same vein, the study by Adams (2009) shows that a positive relationship exists between domestic investment and economic growth sub-Saharan Africa while Garza-Rodriguez, et al. (2016) conclude that population growth influences economic growth positively in the long-run.

On the one hand, our results show that government consumption expenditure and trade openness have depressing effects on economic growth. However, the negative effect of government consumption expenditure is not statistically significant, while that of trade openness is only significant at the 10% level.

In French-colonised West African countries, we find that CPI still has a positive effect on economic growth. Likewise, population has an insignificant negative effect on economic growth. However, government consumption expenditure and trade openness have positive effects on economic growth. Surprisingly, we find that gross fixed capital formation has a negative and

significant effect on economic growth. Unlike the case of French-colonised countries in West Africa, all the explanatory variables, except trade openness, which has a positive and insignificant effect on economic growth, have negative and significant impacts on economic growth of the British-colonised countries in West Africa.

5. Conclusion and Policy Recommendation

Examining whether institutions foster economic growth has been the preoccupation of researchers since the celebrated works of Douglas North. In this study, we examined, in a robust manner, the effect of institutions on economic growth in West Africa following three approaches. First, we examined the impact of six institutional variables (government stability, control of corruption, law and order, democratic accountability, bureaucratic quality and socioeconomic condition) on economic growth for each of the selected West African countries. Second, we explored the impact of these institutional variables on economic growth in the region of West Africa. Finally, we examined whether the impact of institutions on economic growth is affected by the colonial experiences of West African countries. In this regard, we divided the selected West African countries into former French-colonised and British-colonised countries. The data employed spans from 1986 to 2016 and the methods of estimation utilised OLS and pooled OLS, fixed effects and random effects.

Briefly, our findings show that the impact of institutions on the economic growth of each country varies. Specifically, we find that government stability, law and order, democratic accountability and the quality of bureaucracy have a positive influence on economic growth but only government stability and democratic accountability are statistically significant. However, control of corruption and socioeconomic conditions exercise depressing effects on economic growth. Finally, institutions contribute positively to economic growth in French-colonised countries compared to the British-colonised countries.

The overall implication of these results is that institutional development is still at a low ebb in the West African region. Thus, enormous work must be done to strengthen different institutions in the region, particularly for the British English-speaking West African countries to guarantee the long-term positive effects of institutions on economic growth. This is very crucial in

the areas of rule of law and control of corruption that have the potential to stifle investment and consequently impede rapid economic growth.

Notes

[1] Davis and North, 1970; North and Thomas, 1973; North, 1988, 1990, 1991, 1992 and 2005.

[2] 13 countries out of the 16 that make up West Africa are chosen due to the availability of data on institutional quality.

[3] The three ways by which institutions can be incorporated into the neoclassical growth model is either through initial technical efficiency A(0) or by relaxing the assumption of identical rates of technical progress (g) across countries or by the generalisation of the production function to allow for productivity enhancement not only for labour but also for total reproducible capital.

[4] The 13 countries included in the analysis are Burkina Faso, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone and Togo. Benin, Cape Verde and Mauritania were exempted because they are not included in the World Governance Database.

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