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Ethnic Diversity and Capital Formation in West African Countries

Abstract: This paper investigates how ethnic diversity influenced capital formation in West African countries using a cross-country dataset ranging from 1991 to 2017. Using the fully modified ordinary least square method, the results showed that one of the important factors responsible for capital formation in the region is ethnic diversity. Other factors found influencing capital formation in the region were interest rate, foreign direct investment, inflation rate and financial development. Thus, the government should ensure that the countries' resources are not controlled and beneficial to the people with the same cultural groups as it accounted for the poor state of the region's investment base.

Keywords: Ethnic diversity, investment, interest, inflation, output, West Africa

1.0   Introduction

Ethnic fragmentation has become an unavoidable factor to consider when studying the determinants of growth and development in an economy. For instance, Easterly and Levine inaugurated the argument that a fragmented countries' ethnic structure, measured by the ethno-linguistic fragmentation index, negatively influences countries' growth. Past studies found how it adversely affects income distribution and poverty as well as human development, also the cost and consequence of ethnic fragmentation has been widely noted Easterly and Levine (2005). However, some also focusing on diversity impact on economic growth find out that ethnic diversity does not play a significant role in determining economic growth in terms of GDP per capita (Ruslan, 2018). One of the disadvantages of an ethnic fragmented society leads to political instability, poor quality of institution and badly designs economic policy and disappointing economic performance (Alessina and Easterly, 1999). Easterly and Levine(1997) argued that much of Africa's growth failure is due to ethnic conflict partly as a result of absurd borders left by former colonizer. Meanwhile,much less is known about the impact on a fragmented society ethnically in West Africa on capital formation. A nation that wants to meet her objectives of development needs capital formation and also to free the region from the vicious circle of poverty in the West Africa region there must be high investment, which leads to high employment and increase income that has an end, that is increase in standard of living, and this can only be actualize through capital formation. A nation that needs to meet her objective of economic growth and development needs capital formation (physical capital stock) or capital accumulation. In addition, capital formation which is bedrock for growth and development according to Harrod Domar model may be measured through building of capital equipment on a sufficient scale to increase productivity in agriculture, mining, plantations and/or industry on the one hand. While on the other, capital is required to construct schools, hospitals, roads, railways, improve standard of living and foster research and development etc. (Jhingan, 2006; Ainabor, Shuaib & Kadiri, 2014). The higher the rate of capital formation (physical as well as

human), the faster is the pace of economic growth. Meanwhile, the deficiency of capital has been the primary cause of underdevelopment in the third world economies. With the growth of technology and specialization, capital has become more complex and is of superior and advanced type. More goods can be produced with the aid of capital. In fact, greater productivity of the developed economies like that of USA is mainly due to the extensive use of capital, i.e. machinery, tools or implements in the productive process. Capital adds greatly to the productivity of worker and hence of the economy. Much economic development is not possible without making and using of industrial machinery, making of agricultural tools and implements, building of dams, bridges, factories, roads, railways, airports, ships, ports, harbours, etc., which are all capital. All these capital goods are man-made instruments of production and increase the productive capacity of the economy. This study therefore investigates the impact of ethnic diversity on capital formation in West African countries within the periods of 1991 to 2017. Other sections apart from this introductory section are divided into four. The second section provides the literature review of relevant studies, while the methodology of the study is presented in section three. Empirical result and discussion are presented in section whereas, the last section provide conclusion and offer policy suggestions.

2.0   Literature Review

This research study reviewed previous studies related and relevant to the discourse. In the empiric literature, the association between different forms of ethnic diversity and economic performance has been the focus of considerable economic research over the last decades, generally finding that "ethnicity does matter in economics". However, the empirical research supports opposing hypotheses regarding ethnic diversity and economic performance, suggesting both positive and negative effects on outcomes as well as more or less strong and/or significant influences (Constant *et al.* 2009; Olzak, 2011). This may reflect attempts to identify economic consequences of ethnic diversity at different levels of economic analysis – macro (growth and development), meso (sectors and regions) and the micro (firms and individuals) –

even though the full heterogeneity of contexts and dimensions of diversity have yet to be researched.

A number of empirical studies report a negative effect of ethnic diversity on economic outcomes. Easterly and Levine (1997) focus on ethno-linguistic diversity at the national level and find that ethnic diversity is associated with slow economic growth in Africa. Moreover, the effect of ethnic diversity is negative not only in its direct effect on economic growth, but ethnic diversity partly explains variations in economically relevant indirect indicators such as schooling, political stability, financial systems, foreign exchange markets, government consumption and infrastructure. On this argument, ethnic diversity can exert indirect effects by influencing the operation of channels or policies that affect long-run growth rates. In line with this, Goren (2014) identifies a direct negative effect of ethnic diversity on economic growth in a global sample as well as number of indirect transmission channels through which diversity may affect growth – namely, schooling, political instability, market distortions, trade openness and the fertility rate. Also, Escaleras and Register (2011) find that ethnic diversity and tensions negatively affect the formation of social infrastructure (e.g., public utilities, education, health care), thereby imposing an unnecessary burden on growth and development.

Similarly, Alesina *et al.* (1999) investigate a sample of US cities and find that greater ethnic diversity in US local jurisdictions is associated with higher spending and higher deficits/debt per capita, but still with lower provision of the core public goods like education and roads. Patsiurko *et al.* (2012) report a negative association between ethnic fractionalization and economic growth for OECD economies. In addition, the authors identify the greater importance of 'ethnic fractionalization' in comparison to other forms of fractionalizations, such as religious and linguistic. Similarly, Reynal-Querol and Montalvo (2005) in their cross-country research likewise find that ethnic polarization has a negative effect on economic development. These authors argue that ethnic polarization reduces investment, increases government consumption and entails a higher probability of civil conflict, which ultimately reduce economic development. Although the above discussed literature identifies a

negative effect of ethnic diversity on economic performance, the perspective of these studies is primarily macro-economic and often focused on indirect influences on economic outcomes (e.g. through its effect on government efficiency and provision of public goods and services).

Alesina *et al*. (2003) updated the original ELF index by calculating individual measures of ethnic, linguistic, and religious fractionalization for 190 countries in the 1990s. Their main source is the Encyclopedia Britannica. They argue their measures are more comprehensive than those previously used in the literature as these data, which features the underlying group structure of ethnicities, religions, and languages, allows the computation of alternative measures of heterogeneity (that is, fractionalization as well as polarization). The following results obtain: (a) the impact of ELF on growth is negative and robust; (b) ELF is highly correlated with GDP per capita, latitude, and the quality of government so that is difficult to be assertive on causality; and (c) while high ethnic fractionalization is associate with low government quality, the reverse seems true with respect to religious fractionalization.

Bellini *et al*. (2012) conduct similar research focusing on European regions in twelve European Union countries and find consistent results – namely, ethnic diversity is positively correlated with productivity, where causation goes from diversity to productivity. Ottivano and Peri (2006) find that ethnic diversity is associated with higher wages of the resident population in US cities, hence producing a positive effect on the economic performance of individuals. Related to the positive strand of the literature is Collier et al. (2001) who categorize ethnic diversity into 'dominance' and 'fractionalization'. The authors find that ethnically diverse societies characterized by ethnic dominance are likely to have worse economic performance, while in diverse societies characterized by ethnic fractionalization this is not necessarily the case, especially in democratic societies. In other words, ethnic diversity is damaging if it takes the form of dominance over fractionalization.

Gibson and Hoffman's (2013) study of Zambia details a different explanation for the sub-national diversity dividend by examining levels of government spending. They argue that political institutions, specifically electoral systems, can motivate politicians to engage with multiple ethnic groups even in situations where ethnicity is relevant to their political stance. And they hypothesise that, rather than policy gridlock, the greater the number of ethnicities represented in a legislative coalition, the greater public expenditure will be due to the frequency of demands on politicians. Employing methods usually found in cross-national studies, they use district-level government budget and census data to test their hypothesis. The authors find that political institutions can foster cooperation between legislators and lead to more expenditure in areas of high ethnic diversity (Gibson and Hoffman, 2013). They conclude, therefore, that institutions that foster coalition building can overcome diversity debits and channel public pressure into responsive governance.

Alesina *et al*. (2016) provides a survey of the impact of diversity on productivity in teams and concludes that ethnically diverse teams often work better on micro-level. In contrast to the above negative and positive findings, Barro& Sala-iMartin (2004) find ethnic fractionalization to be insignificant in explaining economic growth. In the study of Jose and Reynal-Querol (2017) in their work titled Ethnic diversity and growth revisiting the evidence, they investigated the relationship between ethnic diversity and economic growth using a multiple regression on a cross country data found a negative or a statistically insignificant relationship between ethnicity and economic growth. Goren (2014) suggests that whereas ethnic diversity has a strong direct negative impact on economic growth, ethnic polarization has indirect negative economic effects through investment, human capital, instability, openness, and civil war. In line with this, Goren (2014) identifies a direct negative effect of ethnic diversity on economic growth in a global sample as well as number of indirect transmission channels through which diversity may affect growth, namely, schooling, political instability, market distortions, trade openness and the fertility rate.

The review of the literature shows that the relationship between ethnic diversity and economic outcomes most especially output growth was inconclusive and an empirical issue that should be further investigated. Despite the myriad of existing

literature on ethnic diversity and economic growth scanty attention has been given to the effect on capital formation which is a necessary condition for an economy to grow and develop according to Harrod Domar model. This study is therefore different from previous studies as the gross fixed capital formation will be used to investigate the relationship in West Africa region.

3. Methods

The theoretical framework used in this study to model the relationship between ethnic diversity and investment is the neoclassical growth model. This growth model is the starting point of almost all analyses of growth (Romer, 1996) and used extensively as a growth accounting device. The main advantage of using this model is that it provides us with proven variables that explain growth. These variables are used as robust control variables with clearly defined signs and expected effects on economic growth. Therefore, when using the neoclassical model as basis for econometric analysis it can be clearly seen when something is not correct with the model. This clarity and simplicity of the base model are useful given the relative unpredictability and complexity of the diversity measures.

The Solow model first assumes the Cobb-Douglas production function. Total output is a function of physical capital, labour and technology, which is exogenous and therefore is constant. The second assumption is that population growth is constant and equal to labour growth. The other assumptions include a constant savings rate, a closed economy, and that investment is a function of how much the country wants, how much the country has, and depreciation. There are implications following the neoclassical growth model. There is conditional convergence, no long-run growth, a need for continuous exogenous increases in technology to get long-run growth, and empirically, we observe very slow convergence. We consider an economy consisting of a single good, which is used either for consumption or investment, produced by labour L and capital K in a process described by a Cobb-Douglas production function as:

$$Q(L_{it}, K_{it}) = AL_t^{\beta} K_t^{\alpha} \qquad (1)$$

Where: Q is the quantity of products; L is the quantity of labor; K is the quantity of capital; A is a positive constant; β and α are constants elasticities between 0 and 1; i is country; t is time. This can also be rewritten as:

$$Y = K_{it}^{\alpha} (AL_{it})^{1-\alpha} \qquad 0 < \alpha < 1 \qquad (2)$$

Where: Y is the flow of output and A is the level of technology which accommodates other variables in the models used for this work. Physical capital tends to accumulate over time through investment. However, this study follows a simple neoclassical specification of growth model by Hall and Jorgenson (1967) where the optimal capital stocks of country i at time t,

$$K_{it}^{*} = \frac{\theta Y_{it}}{R_{iit}^{\sigma}} \qquad (3)$$

Where: θ and σ are, respectively, the output and substitution elasticities of capital. To obtain investment, substitute the optimal capital stock with the equation of motion of capital.

$$K_{i,t+1} = (1-\delta)K_{it} + I_{it} \qquad (4)$$

And, applying the result that, in the steady state, the growth rate of capital is the growth rate of output (so that $K_{i,t+1} = (1 + \varphi_{it}) K_{it}$, where φ is the GDP growth rate), yields an estimable empirical specification.

$$i_t = \beta + y_{it} + g_{it} - \sigma r_{tt} \qquad (5)$$

Where: $\beta \equiv \ln \alpha$ and $\ln(\varphi_{it} + \delta)$ is the (depreciation-adjusted) growth rate, and lowercase letters indicate the logarithm of the respective uppercase variables.

Furthermore, following the argument of Garcia-Montalvo & Reynal-Querol (2005a) in choosing the most common specifications for the investment equation and for each of the transmission channels to avoid "variables fishing", the following variables used are: financial development, exchange rate, foreign direct investment, and human capital. The functional form of the model is written in a production function form as thus:

$$inv = f (ethn, gdp, int, fin, exc, inf, fdi, hc) \qquad (6)$$

Expressing this mathematically, the model specification for the analysis is given as;

$$inv_{it} = \phi_0 + \phi_1 ethn_{it} + \phi_2 gdp_{it} + \phi_3 \text{int}_{it} + \phi_4 fin_{it} +$$

$$\phi_5 exc_{it} + \phi_6 fdi_{it} + \phi_7 \inf_{it} + \phi_8 hc_{it} + \mu_{it} \qquad (7)$$

Where; inv = gross fixed capital formation; ethn = Ethnic Fractionalization computed by Alesina *et al*. (2003); gdp = gross domestic product; int = interest rate; fin = domestic credit to private sector by bank; exc = exchange rate; fdi = foreign direct investment; inf = inflation rate; hc = human capital measured by primary school enrolment to capture the education level of each country; ϕ_0, ϕ_{1-8} are parameters; μ = error term.

In regards to the theoretical expectations, ethnic fractionalization which deals with the number, sizes, socioeconomic distribution, and geographical location of distinct cultural groups, usually in a state or some otherwise delineated territory is expected to have an indirect relationship with investment since it causes drag to output. The study expects a positive relationship from income level to investment while a negative relationship from interest rate. Similarly, a direct relationship is expected from financial development in term of an improvement in domestic fund being made available to investors for investment purposes. For exchange rate, currency depreciation is expected to attract more foreign fund which will boost investment portfolios while its appreciation may make investment more costly mostly for developing counties that has many of its industries importing foreign raw material for their businesses.

Inflation is a quantitative measure of the rate at which the average price level of a basket of selected goods and services in an economy increases over a period of time. In the model of Bouwens (2010) it shows a negative relationship and significant effect. It is used as a determinant for capital formation as it has it effect on saving. Also, human capital is the stock of habits, knowledge, social and personality attributes embodied in the ability to perform labour so as to produce economic value. One of the main reasons vital for Barro to accept the theory of convergence, was the fact that he found that countries where not competing at a similar level.

Where the population of rich countries was generally well educated and enjoyed a healthy life that contrary to that of poor countries. This initial level of human capital is the main reason why absolute convergence does not take place (Barro 1991). Mean years of schooling and expected year of schooling is used as proxy.

The panel data econometric procedures were used in order to examine the impacts of ethnic fragmentation on capital formation. There are four steps involved in estimating the relationships. The first step is to test the stationarity (i.e. determine their order of integration) of the panel data using the method of the Phillips Perron-fisher and Breitung LLC unit root tests. The principle behind the diagnostic test of stationarity and others is to ensure that the results of the regression analysis are not spurious. It is required that the stationarity property of the panel date be investigated to ensure the use of OLS or not.

After establishing their orders of integration, the study proceeds to an examination of the panel data for the presence of a long run relationship among all variables in the model. However, the cointegartion was also tested using the Pedroni residual cointegration test. Once the co-integration is confirmed in the model, then the panel Fully Modified Ordinary Least Squares (FMOLS) approach was used to test the long run relationships of the variables. The FMOLS method produces reliable estimates for small sample size and provides a check for robustness of the results. The FMOLS method was originally introduced and developed by Philips and Hansen (1990) for estimating a single co-integrating relationship that has a combination of I(1). In order to achieve asymptotic efficiency, this technique modifies least squares to account for serial correlation effects and test for the endogeneity in the regressors that result from the existence of co-integrating relationships. The study employed a secondary data source from the database of CIA fact book and World Development Indicators (2018).

4.0 Data Analysis, Results and Interpretation

This section of the research study dealt with descriptive and econometric analysis of the impact of ethnic diversity on capital formation in 16 West

African countries within the period of 27 years 1991-2017. It covers descriptive analysis, correlation analysis, panel unit root test, panel cointegration test and panel regression results.

4.1 Descriptive Analysis

The descriptive characteristics of the 16 pooled West African countries data employed in the estimation of the panel static regression models for ethnic diversity and capital formation is shown on Table 1. The average value of capital formation measured by gross fixed capital formation to GDP

in the region was 24.39%. Both minimum and maximum values of investment to GDP stood at 4.56% and 60.02% respectively. On the part of ethnic diversity, the average value of the presence of different ethnic backgrounds or identities of the people in the region annually from 1991 to 2017 was 0.7567, while its maximum value was 0.9084 and the minimum is 0.4174. This indicates that the region has a sizeable number of nations with people that reflect on their different cultural and social belief.

Table 1: Descriptive Statistics

	Mean	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Prob.	Obs.
INV	24.39428	60.0183	4.5625	10.96848	0.954967	3.933218	31.81948	0	169
ETHN	0.756705	0.9344	0.4344	0.10509	-1.10676	4.770157	56.56658	0	169
GDP	4.580699	20.7158	-20.5988	4.09833	-0.72297	12.53756	655.2677	0	169
INT	5.620468	33.4668	-45.9485	9.701566	-0.72383	8.633557	238.2386	0	169
FIN	24.82594	100.282	-0.00191	17.8879	1.781111	6.759865	188.8998	0	169
EXC	491.3867	7384.43	8.19458	977.1308	5.020027	29.51732	5661.295	0	169
FDI	5.254499	86.9894	-1.03813	8.416481	6.20409	55.62988	20588.9	0	169
INF	93.51967	183.853	2.75263	29.39591	-0.79776	4.884201	42.92547	0	169
HC	91.25973	132.468	48.3466	18.73931	0.158965	2.745387	1.168264	0.5576	169

Source: Author's computation (2019) from WDI (2018).

On the part of the key factor determinants of capital formation, the mean growth values of gross domestic product, interest rate and inflation rate were 4.58%, 5.62% and 93.52% respectively. More so, the averages of other controlling variables show that the average of foreign direct investment and domestic credit to private sector by bank to the size of the Nigerian economy stood at 24.83% and 5.26% respectively. Likewise, the mean value of exchange rate and human capital measured by primary school enrolment rate was 491.39 local currency unit to a unit of US Dollar and 91.26% correspondingly. In addition, the standard deviation reports the rate at which these variables deviate from their individual mean values. Real interest rate, official and foreign direct investment have high deviation rate greater than their respective

mean values whereas the standard deviation of other indicators were lower than their average values.

Furthermore, ethnic diversity, income, real interest rate and inflation were found to be negatively skewed with values of -1.1068, -0.7229, -0.7238 and -0.7978 respectively, whereas, other variables are rightwardly skewed. As well, the Kurtosis identified 3.0 suggesting the normal distribution was not reported in the table. This implies that none of the variables were normally distributed. Of all the variables, only human capital was platykurtic in nature while the remaining variables were leptokurtic.

Table 2: Correlation Matrix

	INV	ETHN	GDP	FIN	FDI	INT	INF	EXC	HC
INV	1								
ETHN	-0.334	1							
GDP	0.145	-0.168	1						
FIN	0.073	-0.300	-0.025	1					
FDI	0.213	0.082	0.051	0.135	1				
INT	-0.059	-0.056	0.110	0.076	0.058	1			
INF	0.110	0.026	0.094	0.089	0.178	0.042	1		
EXC	0.058	0.123	0.044	-0.134	0.024	-0.010	0.363	1	
HC	0.207	-0.073	0.138	0.434	0.258	0.072	0.355	0.051	1

Source: Author's computation (2019) from WDI (2018).

4.2 Correlation Analysis

Table 2 revealed the partial correlation between the indicators of ethnic diversity and capital formation in West Africa. The result from the correlation matrix shows that the relationship between ethnic diversity and capital formation is negative. Similarly, a negative correlation coefficient was derived for real interest rate and capital formation. The correlation relationship of capital formation and other factor determinants were positive. More so, the magnitudes of the correlation coefficients are low indicating weak level of association. The same results with low magnitude varying between positive and negative values were reported within the independent variables. Nonetheless, the moderate to low degree of association among the variables make them suitable for the analysis.

4.3 Panel unit root result

In Table 3, the study presents the panel unit root result for the heterogeneous process (Im *et al*. 2003) and the homogenous unit root tests (Levin *et al*. 2002). The table shows clearly that for the panel, we do not accept the null hypothesis of unit root at level for capital formation, gross domestic product, financial development and real interest rate. This indicates that they are stationary at levels. However, other variables like ethnic diversity, financial development, inflation, exchange rate and human capital do not reject the null hypothesis at level. This study then test the stationarity level at first difference and therefore observed that they variables are stationary. This means that at the first difference, the null hypothesis of unit roots in the panel is rejected while the alternate hypothesis of no unit root is accepted.

Table 3: Unit Root Test

Variables	Level			1st difference		
	PP-Fisher	IPS	LLC	PP-Fisher	IPS	LLC
INV	79.396***	-2.8446***	-3.5524***	-	-	-
ETHN	34.2905	9.8335	0.3323	58.1049***	-4.0920***	-3.8376***
GDP	199.72***	-6.5718***	-4.3636***	-	-	-
FIN	15.5081	3.4512	2.5387	237.81**	-7.3156***	-5.1168***
FDI	83.582***	-4.5056***	-4.0487***	-	-	-
INT	142.51***	-5.7166***	-6.5635***	-	-	-
INF	38.7482	4.5392	2.0070	105.89***	-3.4774***	-1.7970***
EXC	32.8251	0.9155	1.7584	167.98***	-7.1449***	-7.3957***
HC	45.4899	1.4248	-0.8160	109.63***	-3.1834***	-1.7401***

Note: PP is Phillip Peron; IPS is Im, Pesaran and Shin; LLC denotes Le vin, Lin and Chu; ***1% significant; **5% significant.
Source: Author's computation (2019) from WDI (2018).

4.4 Panel Cointegration Result

This sub-section conducted the panel cointegration test of the variables to verify if there is a long-run relationship between the variables. The test is carried out using the Kao residual cointegration test. The result presented in Table 4 revealed that there is a long-run relationship between the variables. Thus, the study concludes that ethnic diversity, income, financial development, foreign direct investment, interest rate, inflation, exchange rate, human capita and investment in the 16 West African countries are cointegrated. It implies that capital formation of these countries depend greatly on the independent variables in eth long-run.

Table 4: Panel Co-integration Result

Kao Residual Cointegration Test
Series: INV ETHN GDP INT FIN EXC FDI INF HC
Sample: 1991 2017
Included observations: 432
Null Hypothesis: No cointegration
Trend assumption: No deterministic trend
Automatic lag length selection based on SIC with a max lag of 0
Newey-West automatic bandwidth selection and Bartlett kernel

	t-Statistic	Prob.
ADF	-3.266440	0.0005
Residual variance	17.31030	
HAC variance	14.66285	

Source: Author's computation (2019) from WDI (2018).

4.5 Panel Regression Results

The results of the panel fully modified ordinary least square (FMOLS) are presented in this section of study. Table 5shows the panel FMOLS results of the relationship between ethnic diversity and capital formation measured by gross fixed capital formation to GDP in West African countries. The panel estimates showed that ethnic diversity has a positive and significant impact on capital formation in West African countries. It does not follow the theoretical expectation. In magnitude terms, a 10% change in ethnic diversity lead to an increase in capital formation by 12.97%.

Table 5: Panel Fully Modified OLS Results

Dependent Variable: INV

Method: Panel Fully Modified Least Squares (FMOLS)

Sample (adjusted): 1991 2017

Cross-sections included: 16

Total panel (unbalanced) observations: 237

Panel method: Pooled estimation

Cointegrating equation deterministics: C

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ETHN	1.296445	0.507662	2.553754	0.0120
GDP	-0.324130	0.212918	-1.522322	0.1307
INT	-0.281268	0.134058	-2.098111	0.0381
FIN	-0.153479	0.089488	-1.715081	0.0890
EXC	-0.013622	0.023288	-0.584937	0.5597
FDI	0.739031	0.214524	3.444980	0.0008
INF	-0.255161	0.085823	-2.973096	0.0036
HC	0.115950	0.122605	0.945722	0.3463
Constant	7.356232	2.183031	3.369733	0.0013

R-squared	0.761773	Mean dependent var	25.23933
Adjusted R-squared	0.718271	S.D. dependent var	10.74379
S.E. of regression	5.702604	Sum squared resid	3739.765
Long-run variance	45.45409		

Source: Author's computation (2019) from WDI (2018).

Also, the results revealed that the coefficient of GDP growth and financial development measured by domestic credit to private sector by banks to GDP were negative. None of them were found to be significant at 5% but the coefficient of financial development was statistically significant at 10%. They do not follow a'priori expectation. Also, a 10% increase in GDP growth and financial sector development deteriorates the level of capital formation in West African countries by 3.24% and 1.54% respectively. Similarly, an indirect relationship was reported from real interest rate and inflation rate to capital formation in the region but they are in line with the a'priori expectation. It implies that low interest and inflation contributed to capital formation in the region. Numerically, 2.81% and 2.55% improvement in the region's capital formation resulted from 10% decline in real interest rate and inflation rate respectively.

In addition, the parameter estimate of foreign direct investment was positive, indicating that it influenced capital formation positively. The coefficient of foreign direct investment was also found to be significant at 0.05 critical level. This implies that foreign direct investment is a major determinant of capital investment in the region.

Also, human capital was found to boost the level of capital formation in the region but was not significant at 5%. In magnitude terms, a 10% change in foreign direct investment and human capital improve the level of capital formation in West Africa by 7.39% and 1.16% respectively. The parameter estimate of currency depreciation was negative implying that currency depreciation retards the level of capital formation in West Africa. The coefficient was not significant at 5%. The adjusted R-square value indicated that ethnic diversity, income and other control variables accounted for about 71.8% variations in capital formation measured by gross fixed capital formation to GDP.

5.0 Conclusion and Policy Options

This study examines the relationship between ethnic diversity and capital formation measured by the proportion of gross fixed capital formation to GDP in 16 West African countries. It became necessary to make enquiries on the inconclusiveness of previous studies conducted for the developing countries like the West African region. Based on this identified gaps, this study used the data sets obtained from the World Development Indicators from 1991 to 2017. The results showed that capital formation, gross domestic product, financial development and real interest rate were stationary at level while other variables like diversity, financial development, inflation, exchange rate and human capital were stationary at first difference. **The findings also showed that there is a long-run relationship between ethnic diversity and capital formation. Furthermore, the parameter estimates** showed that ethnic diversity has a positive and significant impact on capital formation in West African countries. It indicated that one of the important factors responsible for capital formation in the region is ethnic diversity. More so, low GDP growth indicating poor improvement in economic activities in the region also retard capital formation but its estimates was not statistically significant at 5%. **Thus, the government should ensure that the countries' resources are not controlled and beneficial to the people with the same** cultural groups as i**t accounted for the poor state of the region's investment base.**

In addition, poor domestic credit provision to the private sector by bank was found responsible for low capital formation in West Africa. The study however found that low interest rate boosts the level of capital formation in the region. Similarly, low inflation rate also improves the level of capital formation. Therefore, **the apex bank should ensure that the interest rate is low since it is one of the factors that attract investment flows.** Other important factors driving the level of capital investment in West African countries were foreign direct investment and human capital although the coefficient of the later was found to be statistically insignificant at 5%. **More so, the inflow of foreign investment should be attracted as it boosts the level of capital formation in West African countries. Meanwhile, the people at the helm of affairs should thrive harder to invest in education and skill acquisition programmes. This improves the quality of labour that will available to the financial institution which will in turn positively exert its productivity.**

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