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IMPACT OF FINANCIAL INCLUSION ON POVERTY IN WEST AFRICAN COUNTRIES

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Abstract

The study investigates the impact of financial inclusion on poverty in 15 developing countries in West Africa from 2011 - 2020 based on a composite financial inclusion index constructed using panel data analysis. The study employed the estimation approach which is the differenced Generalized Method of Moments (GMM) and system GMM approach to establish the short and long-run relationships. Financial inclusion was measured using the three (3) demising of accessibility, availability and usage demission using commercial bank branches (CBB) to measure availability. Also, credit to private sector (CPS) to measure accessibility, while automated teller machine (ATM) to measure usage demission of the financial sector. The results of the study show that Automated Teller Machine has insignificant impact on poverty, whereas commercial bank branches, domestic credit from banking sector and domestic credit from the private sector (DCPS) have significant impact on poverty Therefore, the study recommends that financial sector development should focus on the availability, accessibility usage and depth of credit to cover substantial poor and rural populace to help improve their access to financial services, enable them to increase their income and reduce the income gap between rural and urban areas.

Keywords: Financial inclusion; Panel GMM model; Poverty; Financial inclusion index; West Africa.

1. Introduction

Financial inclusion is usually often associated with poverty for many reasons. One of which is the positive correlation between the unbanked population and the poor population. Most of the people who are financially excluded are also poor (Allen, 2016). The lack of access of the poor to financial services deny them the empowerment needed to lift themselves out of poverty given that the financial system is the life blood of commerce and business (Allen, 2016). It is expected that poverty level should ameliorate if more people have access to banking, and this relationship is a subject of continuing enquiry. While there is positive progress in terms of more people gaining access to financial services with some evidence of income growth, the question of whether or not financial inclusion can reduce poverty is yet to be fully answered in the literature and this inquiry is important because poverty reduction is the ultimate aim of financial inclusion (Abhijit, Duflo, Glennerster & Kinnan, 2015).

Financial inclusion is the percentage of individuals and firms that have access to and use financial services offered by formal financial institutions (Naceur, Barajas, & Massara, 2015; World Bank, 2014; Beck & Demirgüç-Kunt, 2008). An inclusive financial system helps in reducing extreme poverty (World Bank, 2014). The main concern of financial inclusion, therefore, is to provide access to an array of financial services such as credit, savings, insurance and money transfers through a variety of financial institutions that will allow the poor and low-income to improve their living conditions and escape poverty (Duvendack & Mader, 2019). Access and usage of financial services in most African fragile states are lower than in other African countries.

Financial inclusion is one of the most widely recognized areas of activity in international development. It was found that globally, about 1.7 billion adults were counted as "unbanked", not having an account with a financial institution or through a mobile money provider and 515 million adults worldwide opened an account between 2014 to 2017 (Demirgüç-Kunt, Klapper & Singer, 2018).

Most of the people in West African countries are "unbanked" for reasons of unaffordability and inaccessibility of financial services as well as low quality (Duvendack & Mader, 2019). It has been recently estimated that about 2 billion people globally lack access to formal financial services sectors. South Asia, East Asia the Pacific, and sub- Saharan Africa account for most of the unbanked people in the world without an account with about 1 (31%), 2 (24%), and 3 (17%), of adults, respectively. In contrast, high income countries account for only 3% of the unbanked, followed by the Middle East (4%), Europe and Central Asia (5%), Latin America and Caribbean (10%) and other countries (4%). This shows that the vast majority of people (about 46%) having no bank account live in developing countries (Seck, Naiya & Muhammad, 2017). As such, financial deprivation is one of the major reasons why poverty is persistently increasing in most developing countries.

Following continued intervention, there is evidence of increase in financial inclusion evidenced by more unbanked poor having access to financial services. Although, the evidence of its direct impact on poverty reduction remains controversial (Agbola, 2017; Miled & Rejeb, 2015). However, extant evidence of poverty reduction is typically about increase in income or expenditure of the poor monetary deprivation dimension (Mwangi & Atieno, 2018); whereas poverty has other social exclusion dimensions (Alkire, Apablaza, Chakravarty & Yalonetzky, 2017). Evidence of the relationship between financial inclusion and poverty in a multidimensional context is required by stakeholders to aid policy and intervention design (Abhijit, 2015; Kumi-Boateng, Mireku-Gyimah & Stemn, 2015).

Despite the existence of extensive empirical literature linking finance and development outcomes, there is, however, limited evidence on the possible link between access to finance and poverty. It is not clear how households (and individuals) benefit from such activities. Nevertheless, access to finance has been viewed as fundamental for poverty reduction, inclusive growth and sustainable development. Financial exclusion is generally low in most developed countries compared to developing countries (Allen, 2016).

This paper tends to breach the gap in finding how access to financial inclusion measures can help in poverty reduction and improve their standard of living. In this connection, this study seeks to investigate the impact of financial inclusion on poverty in West African countries. Thus, this paper is structured into five (5) sections including this introduction. Section two (2) presents the theoretical framework and literature review, section three (3) contains the methodology employed and section four (4) presents the empirical results and discussion. Finally, section five (5) provides for the conclusion and policy recommendations.

2. Literature Review

2.1 Conceptual Framework

Financial Inclusion: The concept of financial inclusion in the literature has different definitions but they all seem to have similar information and content which seem to convey the same meaning. Aduda and Kalunda (2012) (as cited in Lawrence, Kehinde, Olayinka & Nwanneka, 2017) viewed financial inclusion as a process of making available some financial services at a fair price and at the right place without any kind of discrimination to all members of the society by the service provider. World Bank (2014) sees financial inclusion as the way financially excluded and underserved people in a society have access to an array of available financial services without any discrimination. A financial system that is fully working for clients should also offer opportunities to easily access information about available products and their terms, and establish rules protecting the consumer from deception or exploitation. Financially excluded are the people, usually the poor, who lack or have limited access to financial services including credit, savings and insurance due to various factors related to imperfections in the financial markets (Allen, Demirgüç-Kunt, Klapper & Periac, 2016).

Africa's financial system's underdevelopment and its limited outreach are well documented. Low- and volatile-income levels, inflationary environments, high illiteracy rates, inadequate infrastructure, governance challenges, and the limited competition within the banking industry as well as high cost of banking in West Africa are some of the factors used in explaining the underdeveloped financial sector and its limited outreach. However, until recently, very little was known about the actual reach of the financial sector. Removing physical, bureaucratic, and financial barriers to expand financial inclusion is challenging since this also requires addressing the underlying structural causes such as low-income levels and governance challenges (African Development Bank, 2013).

Poverty: The concept of poverty has continued to receive much attention from governments, civil society organizations, donor agencies, and international organizations, among others. As a concept, there are income and non-income dimensions to poverty but no universal agreement as to what constitutes poverty. More than 2.1 billion people in the developing world lived on less than US $ 3.10 a day in 2012, compared with 2.9 billion in 1990. Although the share of the world's population living under the poverty threshold nearly halved, from 66% in 1990 to 35% in 2012, many people still live with far too little. More than 10% of the world's population lived in extreme poverty in 2015; characterized by severe deprivation of basic human needs, including food, safe drinking water, sanitation facilities, health, shelter, education and information. East Asia and the Pacific, South Asia, and sub-Saharan Africa (SSA) account for nearly 95% of global poverty (World Bank, 2016). As a matter of fact, the UN came up with two concepts of poverty related to absolute and overall poverty. Firstly, absolute poverty is a condition where poverty is depicted as deprivation of basic human needs like: food, health, shelter, safe drinking water and so on (Davids, 2010). From this, poverty depends on many factors, not only income, but also on access to a variety of useful services (Davids, 2010).

Looking closely at the United Nations concept of poverty, overall poverty recognises a variety of elements that can contribute to a household's impoverishment apart from focusing only on monetary aspects of poverty. This further shows that poverty is a multidimensional phenomenon. Consequently, in 2010, the UN incorporated another concept in the class of poverty, which was termed the multidimensional poverty index (MPI), which involved a number of issues like education, health, standards of living and many other variables. In the early twentieth century, Some studies have associated financial inclusion with poverty reduction, but literature is still lacking, with mixed results, and empirical findings are still scarce.

2.2 Theoretical Framework

Social Exclusion Theory

Social exclusion theory (Rene Lenoir 1974) is an intrinsic focus, rather than focusing only on the processes and dynamics that push poverty and deprivation to rise and continue as well as the agents that cause it (Davis, 2014). In addition, social exclusion theory made it possible to study structural features of society and the conditions of particular groups together with their social characteristics, like older people, disabled people, landless people and minority ethnic communities which can generate exclusion. Also, social exclusion theory leads to a paradigm shift in focus to the resolution of distributional issues considered to be important aspects in eradicating poverty (Davis, 2014).

Therefore, it follows that inequality is one aspect of the social exclusion paradigm. Inequality is also not restricted to income inequality exclusively, but it is also explained by limited opportunities for poor individuals and in terms of the idea of resources availability in society (Hills & Stewart, 2005). Also, according to Davis (2014), there are other issues which should be taken into consideration apart from income inequality, issues like health and neighborhood inequality. However, the social exclusion theory was criticized on many fronts. Some argued that the theory is one of the least accurately defined concepts and is open to many interpretations when it comes to the theoretical interpretation of deprivation (Hills & Stewart, 2005). Moreover, the concept of exclusion needs to be defined with clarity in relation to society's normal activities. It is alleged that exclusion is more applicable to developed nations like the United Kingdom. In developing nations, a lot of people are excluded from formal sectors, like formal employment, but these people may not be excluded

from normal social patterns and relationships (Davis & Sanchez-Martinez, 2015). Nevertheless, some studies have associated financial inclusion with poverty reduction even though, with mixed results and also require more empirical studies to validate this position.

2.3 Empirical Review

Harley, Adegoke and Adegbola (2017) examined the role of financial inclusion in economic growth and poverty reduction in a developing economy. The result of the study indicates that records of active ATM, bank branches and government expenditures selected from three African countries were the most robust predictors for financial inclusion on poverty reduction in a developing economy. The study also indicates that most of the ATM in developing economies are outdated and thus require a technological upgrade to have a significant impact in rural areas. Moreover, Coulibali and Yogo (2016) examined the effect of financial services on poverty reduction in developing countries. The result indicates that improving access to financial services significantly reduces poverty, especially the countries battling with macroeconomic instability. The result also shows that barriers to financial inclusion have a positive effect on poverty and that increasing access to financial services to the low-income earners can reduce the number of working poor.

Gretta (2017) investigated the impact of financial inclusion on the growth of the economies in developing countries. The study quantified the relationship between financial inclusion in terms of financial activities, financial literacy and growth. The findings show the importance of financial inclusion in the MENA and BRICS region. Schmied and Marr (2016) found that financial inclusion does not have alleviating effect on poverty indicators. However, the study further reveals that access to communication technology plays a significant role in poverty reduction, that it creates employment and income especially in the areas battling with high unemployment.

Gunarsih, Sayekti and Dawanti (2018) reported that increased access to financial services has a significant impact on poverty alleviation, but the impact is more pronounced in the urban areas than the rural areas because of the concentration of the financial services providers in the urban centers. Also, Abimbola, Olokoyo and Farouk (2018) indicate that average current and savings account balance, average number of deposit money bank customers, average loan size to the agricultural sector has positive and significant impact on poverty alleviation. On the other hand, the study also reveals that the cost of borrowing has a negative impact on poverty alleviation.

3. Methodology

The panel GMM data consist of 15 West African countries. The data covers 11 years (2010 – 2020). Countries included in the dataset were selected based on their characteristics as developing countries and the availability of data from the Atlas Classification by the World Bank as of 2020. It is important to note that the choice of variables based on data availability demonstrates an important limitation to this study. This is because lack of financial data for certain developing countries might be indicative of their poor financial systems in the first place (Toxopeus & Lesinki, 2007). Furthermore, data for the study were obtained from Fund various sources such as the World Bank Database, Index Mundi Database, International Monetary Database, Global Findex Database and International Financial Statistics among others.

Five indicators are used to proxy financial inclusion. Thus, for the banking accessibility dimension, the study uses data on 'Bank Deposit Accounts' from 'World Development Indicators (WDI) (2020). This data includes deposit accounts, checking and savings for individuals and others. For the availability dimension, the study used the data on IMF's 'International Financial Statistics (IFS)' Financial Access Survey database which includes Geographical Access. The number of ATMs and bank branches per 100,000 adults were taken from this dataset. Finally, for the usage dimension, the International Financial Statistics and Financial Access Survey database and World Development Indicators (2020) were used for the volumes of deposit and credit relative to GDP for these countries. Since poverty is a vast concept and can exist in various forms, this study employed final consumption expenditure (% of GDP) as a proxy for poverty as it considers multidimensional aspects of poverty like health, education and social service.

3.1 Model Specification

Guide from theoretical analysis on dynamic impact of financial inclusion on poverty, the study adopted a standard model and built on previous studies

(Ibrahim & Aliero 2020; Jiang & Antony, 2019; Bekun & Akadiri, 2019). Thus, the functional model is given as:

POV = *f* (ATM, DCPS, DCBS, CBB) (1)

Whereas POV donates poverty, ATM represents automated teller machines, DCPS is the domestic credit to the private sector, DCBS represents domestic credit by banking sector and CBB is the commercial bank branches. However, for econometric estimation, this study adopted the following mathematical equations in natural logarithmic form given as:

$$LPOV\ it = \alpha\ 0 + \beta 1 LATM\ it + \beta\ 2 LDCPSit + \beta\ 3 LDCBSit + \beta\ 4 LCBBit + \mu\ it \quad \ldots\ldots (2)$$

Where $\alpha 0$ is the constant, $\beta 1$ to $\beta 4$ represents the coefficients of the estimated parameters, *i* stands for number of countries, *t* is the study period and finally, μ represents error terms capturing others variables that are unable to be included in the model. Additionally, the variables are converted into lag in order to normalize the coefficients.

3.2 Estimation Procedure

Given the number of cross-sectional units of this paper, the study covers (15) countries in West Africa. This section compares the result of the cross-section dependency test, unit root test, cointegration test and the result of the Generalized Method of Moment (GMM).

Cross Dependency Test

Basically, Cross-sectional Dependence (CD) test is one of the key pre-estimation tests that must be run prior to estimation of empirical models. Through, CD test, one will know whether cross-sectional dependence exists or otherwise, which in turn will determine the appropriate steps to be taken in the analysis of data. Interestingly, there are a number of CD tests that can robustly detect the cross-sectional dependence menace which includes the Breusch and Pagan (1980) LM test, Pesaran (2004) CD test, and Baltagi (2012) bias-corrected scaled LM test. Regardless of these tests, their overall null hypothesis states "no cross-sectional dependence exists in the data" and Breusch and Pagan (1980) LM test is considered efficient in a small number of cross-section units.

Unit Root Test

Unit root test is to be conducted to determine whether variables are stationary or not. Within the panel unit root-testing framework, there are two generations of tests. The first generation of test assumes that cross-section units are cross-sectionally independent; likewise, the second generation of panel unit root tests relaxes this assumption and allows for cross- sectional dependence (Tugcu, 2018.). However, for the purpose of this paper the second-generation unit root test was conducted using Bain and Ng. and CIPS testing approach.

Cointegration Test

The study also conducts cointegration test by investigating whether long-term relationship exists between the variables or not, using contemporary approaches of cointegration of Pedroni (Engel-Granger based) and Autoregressive Distributed Lag (ARDL) based on Pooled Mean Group (PMG) test. Based on the findings of this paper, the Pedroni cointegration test was used to confirm the cointegration test, as the variables are found to be statistically significant at 1% and 5%, respectively.

Estimation of Non-Cointegrated Panel

If the variables in a panel do not have any integration order, coefficient estimates can be examined by using the pooled OLS that is assumed as one of the most efficient estimators. However, this may result in inconsistent findings, as the OLS ignores the unobservable cross- section (group) and time effects (Tugcu, 2018). To avoid this inconsistency, the fixed effects (FE) or the random effects (RE) models can be applied. Theoretically, if the purpose of the panel data analysis is to reach a general result by using the data of randomly selected cross- section units from the whole sample. Thus, the RE model is an appropriate choice. However, if it is proposed to obtain a general result by employing the data of a fixed group, the most suitable model is FE. However, in the case of endogeneity, the RE model results are biased and inconsistent estimates, whereas it performs better than the FE under the assumption of exogeneity. In this sense, the test statistic (hereafter, Hausman test) that was developed by Hausman (1978) was utilized to provide evidence for the existence or absence of endogeneity.

Estimation of Cointegrating Panel

Due to the endogeneity and serial-correlation problems, the OLS estimators exhibit a non- negligible bias in finite samples for estimating the cointegrated panels. Thus, it is vital to find an appropriate tool for achieving efficient outcomes (Tugcu, 2018). There are basically two approaches for the estimation of cointegrated panels in the field of the Ener Group Nexus (EGN). The first one is the fully modified OLS (FMOLS), which is an extended version of the Phillips and Hansen (1990) methodology. The second approach is the dynamic OLS (DOLS) that was originally developed by Saikkonen (1992) and Stock and Watson (1993).

4. Results and Discussion

4.1 Correlation Analysis

Prior to the regression analysis, it is important to know the correlation coefficient of the variables. This is because understanding the nature of correlation coefficient will guide in deciding the variables that will be included in the model. Correlation analysis also serves as a diagnostic test for checking the presence of multicollinearity. Thus, the results of the test are reported in table 1. According to Agung (2009) and Hamsal (2006), assessing the correlation among the variables will assist the researcher in determining if the variables are multicollinear. As a result of the unanticipated effect of multicollinearity among the independent variables, the parameter estimations may contradict the theory. Furthermore, Iyoha (2004) and Asterios and Hall (2011) said that multicollinearity among variables occurs when the correlation coefficient is greater than 0.95. In accordance with the above explanation, table 1 presents the correlation analysis results.

Table 1: Correlation Coefficients

Financial inclusion and poverty reduction

Variables	LAOP	LATM	LDCPS	LDCBS	LCBB
LAOP	1.0000				
LATM	-0.5946	1.0000			
LDCPS	-0.2195	0.3581	1.0000		
LDCBS	-0.2749	0.3007	0.3681	1.0000	
LCBB	-0.2867	0.1065	0.3488	0.4270	1.0000

Source: *Author's computation using EViews Version 12.*

However, from the link between financial inclusion and poverty reduction, the findings show that automated teller machines, domestic credit to the private sector, domestic credit by banking sector, and commercial bank branches are all inversely connected with poverty, with correlation coefficients of -0.5946, -0.2195, -0.2749 and -0.2867, respectively. The results suggest that concentrating more on financial inclusion components such as automated teller machines, domestic credit to the private sector domestic, credit by banking sector, and commercial bank branches is strongly associated with poverty reduction in the sampled African countries. Hence, according to the findings, there is no presence of multicollinearity among the variables and the variables are well suited to be included in the models for analysis.

4.2 Cross-Section Dependency Test

This subsection presents the outputs of a cross-dependency test capturing the impact of financial inclusion on poverty reduction in the sampled African countries. The results from the model that capture the influence of financial inclusion on poverty reduction show that two out of three approaches indicate the presence of cross-section dependence in residual at 1% level of significance, while the Pesaran CD test show no presence of cross-section dependence among the series even at 10% level of significance. Thus, based on the results, this study concludes that there is presence of cross-section dependence among the variables. Therefore second-generation unit root test approaches are appropriate. Thus, the tests were conducted and the results are presented in table 2.

Table 2 Results of Cross-Section Dependency Test

Financial Inclusion and Poverty Reduction		
Breusch-Pagan LM	145.0985	0.0003
Pesaran scaled LM	4.010044	0.0001
Pesaran CD	1.002315	0.3162

Source: *Author's computation (2023).*

4.3 Results of Unit Root for Cross-Sectionally Dependent Panels

This subsection contains the results of unit root tests from Bai and Ng-PANIC and CIPS testing approaches. The results are summarized and tabulated in table 3.

Table 3: Unit Root Test Results

Variables	Bain and Ng-PANIC test		CIPS test	
	Constant	Constant and Trend	Constant	Constant and Trend
LPOV	2.7806***	-0.96721	-3.7526***	-2.40130
LATM	0.3034	2.9456***	-12.6099***	-6.0361***
LDCPS	0.5017	0.7216	-3.0243***	-4.3465***
LDCBS	2.8933***	5.6782***	-3.3600***	-5.4498***
LCBB	1.2513	-1.0237	-9.1417***	-26.8681***

*Note: ***, ** and * indicate significance at 1%, 5% and 10% respectively.*

Source: *Author's computation (2023).*

This study conducted cross-sectionally dependent panels using Bain and Ng and CIPS testing approaches. From the Bain and Ng test, the results show that automated teller machines are stationary at constant and trend while poverty and domestic credit by the banking sector are stationary at constant. However, domestic credit to private sector and commercial bank branches are not stationary either at constant or constant and trend. From the CIPS test, the results show that automated teller machines, domestic credit to the private sector and domestic credit by banking sector and commercial bank branches are stationary at both constant and constant and trend. On the other hand, the CIPS test shows that poverty is stationary at constant.

4.4 Panel Cointegration Tests

Based on the findings of the panel unit root tests, it is possible to use panel cointegration tests to determine the existence or absence of cointegration. This study used Kao and Pedroni panel cointegration tests to supplement the procedure, and the findings are shown in table 4.

Table 4: Result of Panel Cointegration Test

Cointegration for financial inclusion and poverty	
t-Statistic	P-value
-2.0396	0.0207**

Source: *Author's computation (2023).*

Note: *** *significant at 5% and 10% respectively.*

Table 4 shows that there is evidence of cointegration among the variables. This is due to the fact that the t-statistic coefficients are statistically significant at the 10% and 5% levels. As a result, the null hypotheses are rejected, and we infer that the variables are cointegrated. This study however, used the Pedroni cointegration test to confirm the Kao cointegration test, and the results are shown in table 5.

Table 5: Result of Kao Cointegration Test

Cointegration for financial inclusion and poverty reduction		
Test	Statistics	P-value
Within-Dimension		
Panel v-Statistic	-0.2703	0.6066
Panel rho-Statistic	3.4965	0.9998
Panel PP-Statistic	-17.6023	0.0000***
Panel ADF-Statistic	-6.0358	0.0000***
Between-Dimension		
Group rho-Statistic	5.2321	1.0000
Group PP-Statistic	-17.2041	0.0000***
Group ADF-Statistic	-2.2845	0.0112**

Source: *Author's computation (2023).*

Note: *, **** *and * indicating significant at 1%, 5% and 10% levels.*

The Pedroni panel cointegration test results are shown in table 5. The findings indicate that there is evidence of cointegration among the variables. Although, several tests in both models, such as Panel v-Statistic, Panel Rho-Statistic, and Group Rho-Statistic, are not statistically significant even at 10% level. Nonetheless, the null hypothesis of no cointegration cannot be accepted for the vast majority of tests. This is reflected in the fact that the majority of the statistics are statistically significant at 1%, 5% and 10% levels. According to Pedroni (2004), the panel ADF and group ADF tests have superior small sample qualities than the other tests and hence, provide statistically concludes that there is evidence of cointegration among the variables.

4.5 Result of Generalized Method of Moment (GMM) Regression

This section presents the results of the impact of financial inclusion on poverty reduction in the sampled African countries. The results are shown in table 7. The results show that the system Generalized Method of Moment (GMM) is more appropriate. This is because the coefficient of lag value (0.1543) of the dependent variable (poverty) from the difference GMM is less than the coefficient of the fixed effect regression. Thus, the results suggest that difference GMM is downward biased and the system GMM should be used. Hence, for the sake of comparison, results obtained using different GMM is also reported. Based on the explanation above, this study shall only interpret the results of system GMM regression.

Table 7: Financial Inclusion and Poverty Reduction

Dependent Variable: Poverty Reduction						
Difference GMM Regression				**System GMM Regression**		
Variables	Coef.	St. Error	P-val.	Coef.	St. Error	P-val.
LPOV (-1)	0.1543	0.0322	0.0000	0.2748	0.0335	0.0000
LATM	0.0484	0.0372	0.1964	-0.0014	0.0274	0.9566
LDCPS	-0.0522	0.0161	0.0016	-0.0330	0.0198	0.0991
LDCBS	-0.0904	0.0147	0.0000	-0.0182	0.0265	0.4929
LCBB	-0.0596	0.0316	0.0620	-0.1485	0.0470	0.0021
PLS coef. = 0.6472, FE coef. = 0.2609, AR (1) = -1.2640 (0.2062), AR (2) = 0.8578 (0.3910), J-Sta.1 = 12.1502 (0.2049) and J-sta.2 = 10.5351 (0.3089)						

Note: PLS = Panel Least Square, FE = Fixed Effect, AR = Autocorrelation and J-Sta. = Sagan Test.1 for model 1., and J-Sta. = Sagan Test.2 for model 2.

Source: *Author's computation (2023).*

According to the results, that previous value (lag value) of poverty has a significant positive effect on the present poverty at 1% level. An increase in previous poverty by 1% will lead to a rise in the rate of poverty

by about 0.27% over the sampled period. The results reported in table 7 show that there is a negative and statistically insignificant relationship between automated teller machines and poverty even at 10% level. An increase (decrease) in automated teller machines will lead to decrease (increase) in the level of poverty in the sampled African countries. Thus, the result is not statistically significant and hence, automated teller machines do not influence poverty in the selected African economies over the study period.

Additionally, the results show that there is a negative and statistically significant relationship between domestic credit to the private sector and poverty in the sampled African countries at 10% level. An increase or decrease in domestic credit to the private sector will decrease or increase poverty. This implies that when domestic credit to the private sector increases by 1%, poverty will reduce by at least 0.03% and vice versa. This implies that domestic credit to the private sector is the most important component of financial inclusion and pumping more money to the private sector will create many opportunities such as employment generation, revenue to the government at all levels, and in the long run, it will reduce the level of poverty in the sampled African countries.

Furthermore, the results indicate that there is a negative and statistically insignificant nexus between domestic credit by the banking sector and poverty reduction in the sampled economies. A rise or decline in domestic credit by the banking sector will lead to increase or decrease in the rate of poverty in the selected countries. It implies further that when domestic credit by the banking sector rises by 1%, the rate of poverty will decrease by almost 0.02%. Hence, the result is not statistically significant and this implies that domestic credit by the banking sector does not have any significant influence on poverty reduction in sampled African economies. Again, the results indicate that commercial bank branches have significant negative influence on poverty at 1% level. This implies that an increase or decrease in commercial bank branches will lead to decrease or increase the rate of poverty over the sampled period. Moreover, when commercial bank branches rise by 1%, the rate of poverty in the sampled area will decline by almost 0.14%. This is expected because establishment of bank branches will increase employment opportunities to the residents and thus, reduce the rate of poverty overtime. The result also attests to the fact that commercial bank branches are one of the most important aspects of financial inclusion in the study area.

Lastly, to validate the results, this study conducted diagnostic tests using Arellano- Bond Serial Correlation Test and Sargan (J-Statistics) test. Thus, both the tests indicate that the model is free from serial correlation and is not over-identified. This is because the probability values of the tests are not statistically significant even at 10% level.

5. Conclusion and Recommendations

This study provides contribution on measuring the impact of financial inclusion on poverty and the significant rate of poverty in West African countries even though some of these countries achieved rapid development of financial sector,based on the result, Automated Teller Machine (ATM) and domestic credit by banking sector(DCBS) has insignificant impact on poverty. Also, commercial bank branches (CBB) and domestic credit from the private sector (DCPS) has a significant negative impact on poverty. policy implication of the finding is that increase in CBB and DCPS will decrease poverty in the sample countries. Therefore, the result conclude that financial inclusion from the usage demission has no significant effect on poverty reduction while financial inclusion from the availability and accessibility demission has negative significant effect on poverty reduction in the sample countries within the sample period. Government and relevant stakeholders should support and encourage financial inclusion in form provision of in the rural areas and provide credit facilities at an affordable interest rate Also, government in West African countries should provide channels that will educate the rural populace on the benefit and importance of financial services as it will reduce the level of ignorance in the rural communities, and open-up more opportunities for financial accessibility, which in the long-run will mitigate the poverty level in the sampled countries

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