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# Examining Financial Inclusion, Performance Management and Economic Prosperity in Africa

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**Abstract.** This study examines the nexus between financial inclusion, financial performance and economic prosperity in 54 selected African countries from 2000 to 2020. In order to carry out investigation, if financial inclusion and financial performance influence economic prosperity in Africa, we employed number of registered mobile accounts per 100,000 adults (NRMA), number of agent mobile money outlets per 100,000 adults (NAMO), digital card ownership (DCO), and financial literacy (FINLIT) as measures of financial inclusion; return on assets (ROA); return on equity (ROE) and gross domestic product deflator (GDP-DEF) as measures of financial performance and health (HELT), education (EDU), social capital (S-CAPITAL), gross domestic product per capita (GDPpc) and prosperity index (P-Index) as measures of economic prosperity, while controlling for consumer price index (CPI), foreign direct investment (FDI) and real exchange rate (REXR). Findings from the results of Pedroni and Kao cointegration tests suggested that cointegration exists between financial inclusion, financial performance and economic prosperity. Also, evidence from MG, DFE and PMG results shows that positive long-run relationships exists between financial inclusion, financial performance, and economic prosperity in Africa. In the short-run, the coefficients of the error correction terms for the specified models were negative and statistically significant and the speed of adjustment varies across models. In addition, this study employed differenced and system generalized method of moments (GMM) as robustness check to the earlier findings and it was confirmed that long-run relationships exists between financial inclusion, financial performance and economic prosperity in Africa. Policies which will lead to improvement of financial inclusion and financial performance was prescribed so as to achieve greater economic prosperity.

**Keywords:** Economic Prosperity, Financial Inclusion, Financial Performance.

## 1. INTRODUCTION

Financial inclusion of inhabitance of a nation is one of the proven ways of ascertaining the nation's economic prosperity. The easiness in accessibility and availability of formal financial services, such as bank deposit, credits, insurance, and so on, for all participants in an economy promotes economic prosperity (Kim, et al., 2018). Financial inclusion is also a building block for both poverty reduction and economic prosperity especially with the emergence of digital financial tools which gave birth to digital economy. Economic prosperity however may be seen as one of the key elements of quality of life. It measures how progressive an economy is in terms of standard of living, per capita income, life expectancy, and birth rate, nature of healthcare system, education attainment, technological advancements, entrepreneurship, innovation, research and development. The adaptation of individuals and firms into the financial mainstream is an attainable goal which will be greatly achieved using financial innovation. Nowadays, financial inclusion has made banks to change their conventional banking system and embrace technology to serve wide range of customers globally. When people are financially included, there will be higher rate of financial transactions, ease in doing business, economic growth and development will be achieved.

In the recent time, Economists have been exploring the links between economic prosperity, financial inclusion and financial performance (see: Fukuyama, 1995; Putnam, 2000; Knack and Keefer, 1997; Zak and Knack, 2001; Algan and Cahuc, 2013; and Bjornskov, 2012). Most economists argued that financial inclusion and performance have positive influence on economic prosperity. Traditionally, economists would measure of economic prosperity with gross domestic products (GDP) since it captures the worth of final goods and services in the economy and it is believed to serve as measure of economic well-being. Financial inclusion has been attested to be contributory to economic prosperity, but the rate individuals embrace financial innovation tools are still low especially in Africa. Thus, following the World Bank Global Findex 2017 report, 1.7 billion adults globally are financially excluded, while 1.2 billion have been listed on formal financial system worldwide. Hundreds of millions of people globally have no checking or savings account. Financial exclusion undermines their quality of life and hold their nations' economies back (Luca, Ventura, 2021).

Financial exclusion is very expensive in the aspect of economic prosperity, it worsen people's quality of life and prevents them from investing in their future, leaving them with limited safeguards if they lose their job or fall ill, it makes them vulnerable to usurious and predatory lenders. In other words, access to financial services is a vital factor for coping with and escaping from poverty, which is the 7$^{th}$ out of 17 sustainable development goals (SDGs) of the United Nations. Financial exclusion impedes nations' economic development and prosperity. For instance, in accordance with the report from EY Global – a consulting firm, wider access banking, savings and lending products could boost GDP by up to 14% in large emerging economies like Asia and up to 30% in developing economies like Africa (Luca Ventura, 2021).


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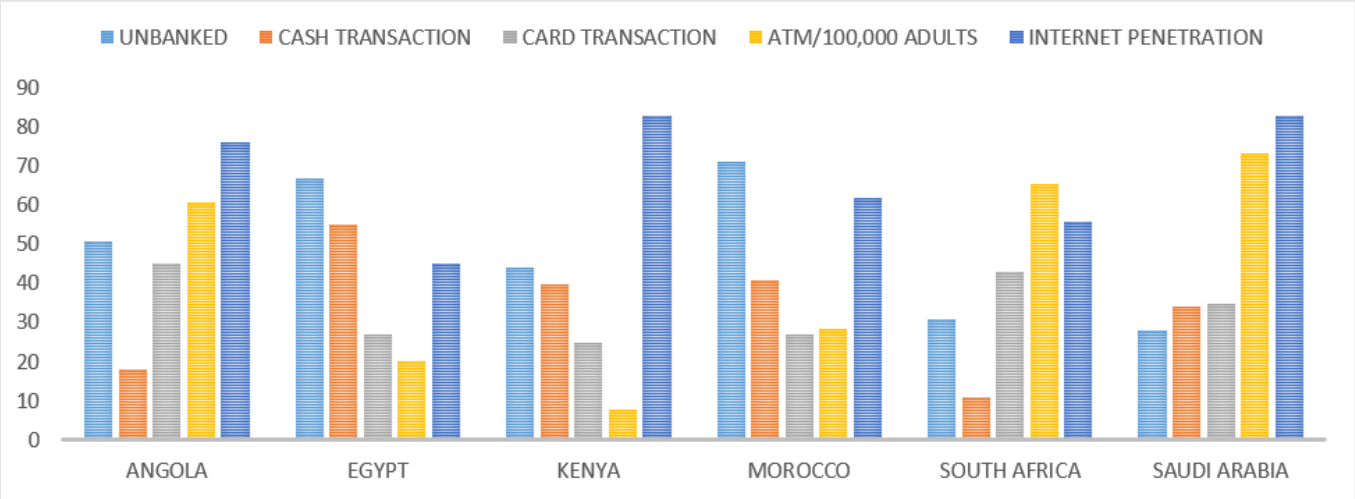


**Figure 1:** Financial Inclusion and Performance in Africa.
**Source:** World Bank Global Finance Publication 2021 edition.

The report of financial inclusion in Africa is still below the expected level. Africa as a developing economy have too many economic bottlenecks emanating from political instabilities, corruption, poor institutional and regulatory quality which hamper growth and development of the region. Financial performance on its own, identifies how well individuals and firms generate revenues and manages assets, liabilities and financial interests it their stakeholders. The financial strengths and weaknesses of firms are viewed by the policymakers as one of the determinants of economic prosperity; the performance of firms in the areas such as labour absorption, optimal mix of factors of production, innovation in production, sales and advertisement of their products and welfare of her workers are used to rate her profitability, liquidity, solvency, efficiency and valuation. The links between the financial performance and sectors of economy on the basis of economic prosperity, develops into the concept of a "trickle-down effect," which means that it encourages growth, development, and prosperity due to an income distribution (Fan et al., 2000; Ravallion & Datt, 2002; Norton, 2002; Dollar and Kraay, 2002; Jalilian & Kirkpatrick, 2002, 2005; Beck and Levine, 2004; Honohan, 2004; Kpodar, 2006; and Beck et al., 2007).

Economic prosperity has been a public discuss among economists, scholars and policymakers. Knowledge drawn from various literature reviewed on the links between financial inclusion, financial performance and economic prosperity shows that many studies have different conclusions and there is dearth of studies who focused on examining the effects of financial inclusion, financial performance and economic prosperity. Most previous works are on financial inclusion and economic growth, financial development and economic growth or financial sector performance and economic growth. Thus, this study focusses on examining financial inclusion, financial performance and economic prosperity in Africa from 2000 to 2020 using panel dynamic autoregressive distributed lag (ARDL) model and panel differenced and system generalized method of moments (GMM). We will utilize number of registered mobile accounts per 100,000 adults (NRMA), number of agent mobile money outlets per 100,000 adults (NAMO), digital card ownership (DCO), and financial literacy (FINLIT) to measure of financial inclusion. In addition we employed return on assets (ROA); return on equity (ROE) and gross domestic product deflator (GDP-DEF) as the measures of financial performance; and health (HELT), education (EDU), social capital (S-CAPITAL), gross domestic product per capita (GDPpc) and prosperity index (P-Index) as the measures of economic prosperity while controlling for consumer price index (CPI), foreign direct investment (FDI) and real exchange rate (REXR). The rest of this study is organized as follows. Section 2 deals with evaluation of economic prosperity, financial inclusion and performance in Africa. In section 3 we review the related literature on financial inclusion, financial performance and economic prosperity. Section 4 describes dmeata, model and thodology. Section 5 presents and discusses the empirical results. Section 6 concludes the study.

## 2. ECONOMIC PROSPERITY, FINANCIAL INCLUSION AND PERFORMANCE IN AFRICA

Economic prosperity is the key element to quality of life and necessary for the nation. To increase wealth, standard of the living, quality of healthcare, education, good governance, natural environment, good economic quality, market access and infrastructure, enterprise conditions, social capital, increased level of happiness, personal freedom, safety and security, the economy must promote innovation and sustain diversity, competition, entrepreneurship, financial inclusion and economic prosperity. The evaluation of financial inclusion, financial performance and economic prosperity in Africa has becomes so important since African continent since African population is fastidiously increasing. According to worldometer record, over 1.9 billion out of 7.9 billion of the world population are living in African continent in 2020. The need for measurement of level of people's well-being is highly needed – hence the value of this paper. In Fig 2 below, the standard of living of some selected African countries namely; Ethiopia, Malawi, Niger, Nigeria, Tanzania and Uganda are measured. Climate risk

was very high in Niger, followed by Malawi and Nigeria. Countries like Ethiopia, Tanzania and Uganda have low climate risk. In the like manner, there was high evidence of food insecurity in Africa. Crop disease was discovered to be high in the most of the sampled African countries; the livestock disease was considerably low, and also the input prices. It was discovered that fall in price of outputs was high in Malawi, and Tanzania; while other countries have increase in the output price. Other measures of economic prosperity (food prices, death rate, illness, conflict, theft and business or employment shocks) was observed to be less in Africa.

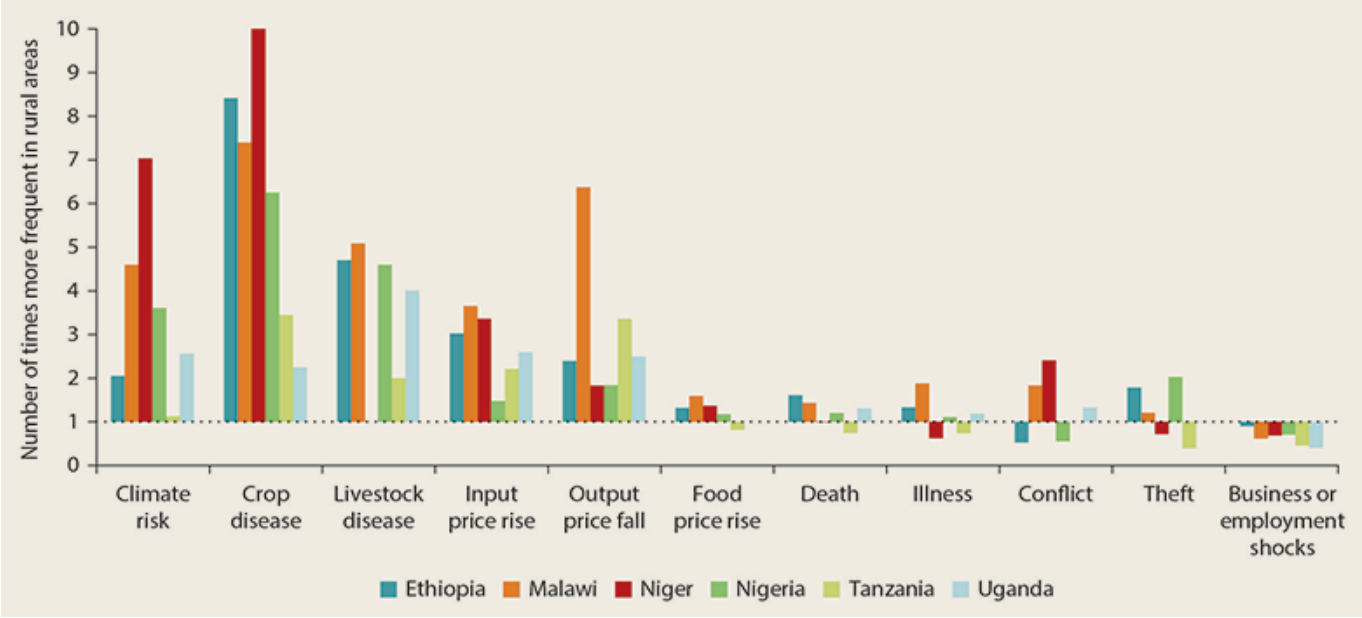


**Figure 2:** Living Standard Measurement of Africa.
**Source:** World Bank Living Standards Measurements Study-Integrated Surveys on Agriculture (LSMS-ISA) in Nikoloski, Christianensen, and Hill (2016).

Synchronization of digital financial tools in various aspects of human lives is of crucial importance for attainment of economic prosperity. According to Global Financial Index 2017, the number of adults in Sub-Saharan Africa with a financial institution account barely budged as at 21% in 2010. However, in 2011, the level of financial inclusion in the region increased to 23%, and in 2017 it increased to 43 percent. Access to formal financial institutions by individuals however, does not necessarily translate to usage of digital financial and financial inclusion tool. Thus, usage indicators however follows a similar movement. Nevertheless, the IMF FAS survey is normally used to capture the outstanding deposits and outstanding loans as percentages of GDP in each country for usage indicators. The report from World Bank's 2017 Global Findex, it shows that in the last three years, 515 million adults had acquired a bank account, and between 2010 and 2017, 1.2 billion people opened an account with a formal financial institution or mobile financial services provider (including mobile money) for the first time. This is impressive progress, but much remains to be done: because as of 2017, 1.7 billion people 16 years or older still did not have access to an account, some 31 percent of the world's adult population (Global Findex, 2017).

In order to boost financial performance and economic prosperity in Africa, employment or entrepreneurship for youth should go beyond just enrollment in education and skill acquisition. Young people need to be able to connect with market opportunities, micro, small, and medium-sized businesses, will still remain backbone of African economic prosperity. There is a great need to improve businesses, create jobs, and hire people. To do this, businesses require more capital, greater management capacity, improved staff skills and accessible markets – hence financial inclusion and innovation is greatly required to improve the economic prosperity of Africa. government are expected to improve digital infrastructures, digitize payments systems and put in place regulations to ensure digital financial services can be made available to and use of everyone (MasterCard Foundation, 2020).

## 3. REVIEW OF RELATED LITERATURE

Economic prosperity is referred to how progressive an economy is in terms of standard of living, per capita income, life expectancy, birth rate, and death rate, nature of healthcare system, education attainment, technological advancements, and entrepreneurship. The interrelationships of economic prosperity, financial inclusion and financial performance is so crucial to economists because the duo financial inclusion and performance contributes greatly to economic prosperity of a nation. Since there is no single economic theory as of now on economic prosperity, theories on economic growth, financial inclusion theories and financial innovation theories as well as empirical literature will be reviewed in this section.

### 3.1. Theoretical Review

Debate on finance-growth nexus has started since Schumpeter (1911) forwarded the view of the importance of financial development for economic growth. Schumpeter argued that development of the financial sector is essential for economic growth and development since it contributes to the economic growth through technological innovations. His argument is that "financial development affects economic growth by providing sufficient fund to the firms that have a best productive use". Later on, Goldsmith (1969), McKinnon (1973) and Shaw (1973) supported this view. Gurley and Shaw (1955), refuting the argument of Neoclassical theorists that importance of financial sector is overstressed by the economists, highlighted the importance of finance for growth. Similarly, on the relationship between finance and growth, Patrick (1966) proposed two important hypotheses; (1) the supply leading hypothesis and (2) the demand following hypothesis. Patrick's argument is that in the early stage of the country's economic development, the financial system leads economic growth. Whereas, as the country advances toward becoming a developed nation, the growth creates demand for the financial sector to be developed and innovated. The theoretical debate on finance-growth nexus further been supported by Levine (1997) arguing finance as the lubricant of the main engine of economic growth.

As proposed by Ozili (2018) in his "Public good theory" of financial inclusion, "the delivery of formal financial services to the entire population and ensuring that there is unrestricted access to finance for everyone, should be treated as a public good for the benefit of all members of the population". As a public good, individuals cannot be excluded from gaining access to financial services. All individuals will enjoy basic financial services without paying for it. Access to financial services to one individual does not reduce its availability to others which means that all members of the population can be brought into the formal financial sector which would make everyone to be better-off. Under this theory, all members of the population are beneficiaries of financial inclusion and nobody is left out.

There is a great need for introducing a robust financial system in an economy to maintain a sustainable economic growth. In the system theory of financial inclusion, Ozili (2018) states that "financial outcomes are achieved through the existing sub-systems (whether economic, social or financial systems) which financial inclusion rely on, and as a result, greater financial inclusion will have positive benefits for the systems it relies on". A significant change in a sub-system (one part of the system) can significantly affect the expected financial inclusion outcomes, for instance, imposing regulations on economic agents and suppliers of financial services – who are part of the economic agents can align their instance with that of the users of basic financial services which can compelled to economic agents and suppliers of financial services to offer affordable and quality financial services to users within defined rules that protect users of financial services from exploitation and price discrimination. Financial service providers should be checkmated by government using a strong governance and institutional quality so that the sole aim of financial inclusion will not be overridden by fintech firms.

A high financial knowledgeable society, are highly financially included and tends to achieve economic growth with ease. Ozili (2018) argued in his financial literacy theory that financial inclusion can be achieved through education that increases the financial literacy of citizens. This theory argues that financial literacy will increase people's willingness to participate in the formal financial sector. The financial literacy theory has some merits. It posits that financial literacy can make people be aware of financial products and services that are available to them. When they become aware of existing financial products and services that can improve their welfare, they will be willing to participate in the formal financial sector by owning a bank account. Secondly, through increased financial literacy, people can take advantage of other benefits in the formal financial sector such as investment and mortgage products. Thirdly, financial literacy can also help people become self-sufficient and can help them have some stability in their personal finance by helping them distinguish between needs and wants, helping them to create and manage a budget, teaching them to save so that they can pay bills when due, and to plan for retirement. Finally, governments that have limited public funds or limited tax revenue to fund financial inclusion activities may prefer to use financial literacy as a national financial inclusion strategy since it does not require much public funds to educate the population on the use of formal financial services (Ozili, 2018).

### 3.2. Empirical Literature

Financial inclusion is seen as one of the major drivers of economic prosperity because, it includes the overall assess to financial assets to people in the form of access to formal bank accounts, access to funds, loans and credits for both firms and households, using digital financial tools. In most cases, economists' uses economic prosperity an economic growth – the increase or improvement in the inflationary-adjusted market value of the goods and services produced in an economy over time interchangeably. Economic prosperity entails the quality of lives and properties of people using measures such as gross domestic product per capita, prosperity index, level of happiness, standard of living, health, education, social capital, etc. As at the moment, there is no or few exact empirical literature on examining the relationship between financial inclusion, financial performance and economic prosperity. Instead, literature on links, between financial inclusion, financial development, financial performance, and economic growth or development will be reviewed.

In a study by Lenka and Sharma (2017) they explored the impact of financial inclusion on economic growth in India from 1980 to 2014 using ARDL bound testing estimation technique. They discovered a unidirectional

causality from financial inclusion to economic growth and therefore concludes that financial inclusion has positive affect on economic growth in short and long run. Focusing on MENA economies, Shihadeh (2018), analyzed how individual characteristics influence the intensity of financial inclusion, it was discovered that women and poor people have less chances to be financially included as they are less likely to have an account with recognized financial institutions because of lesser job opportunities. Furthermore, informal financial institutions with fewer rules and regulations and no collateral requirements makes borrowing easier. He concluded by adding that three aspects of financial inclusion include: formal account, formal savings and formal borrowings. In another extensive study, by Gourene and Mendy (2017) researched the causality between economic growth and financial inclusion in West African Economic and Monetary Union (WAEMU) during 2006 to 2015 with panel causality test of Dumitrescu and Hurlin (2012) and found a two-way causality between economic growth and financial inclusion.

Furthermore, Saab (2017) explored the interactions between financial inclusion and economic growth with a VAR regression in MENA region and discovered a bidirectional causality between indicators of financial inclusion and economic growth. Williams et al. (2017) investigated the effect of financial inclusion on poverty alleviation and economic growth using multiple regression analysis and discovered that financial inclusion had a significant positive influence on poverty reduction and economic growth. In the like manner, Kim et al (2018) utilized dynamic panel regression analysis to analyze the relationship between financial inclusion and economic growth in 57 Organization of Islamic Cooperation countries (OIC) and discovered that financial inclusion influenced economic growth positively. In the like manner, Mwaitete and George (2018) explored the effect of financial inclusion on economic growth in Tanzania over the period of 2008-2015 with regression analysis and discovered that financial inclusion has a positive effect on the economic growth.

In another study conducted by Adegoke and Adegbola (2017) who studied empirical study on the role of financial inclusion on economic growth and poverty reduction in a developing economy using panel log linear model and discovered that financial inclusion affects economic growth positively. Gretta (2017) conducted a study on the impact of financial inclusion on economic growth in developing countries such as MEAN and BRIC region and tried to identify the various channels of transmission between financial literacy, financial intermediaries and economic growth. The study applied VAR regression and discovered that financial inclusion is very important for economic growth of MENA and BRICS region. According to Okoye, et al. (2017), in their study on "financial inclusion as a strategy for enhanced economic growth and development" in Nigeria from 1986 to 2015 using ordinary least squares (OLS) regression technique. The study found that financial inclusion leads to poverty alleviation in Nigeria.

Bertram et al. (2016) identified that full or complete financial inclusion serves as a prerequisite for inclusive economic development in Nigeria. From their outcome of questionnaire survey on financial inclusion which they administered to some stakeholders such as banks, insurance, regulators and telecommunication firms that provide each household with access to a range of modern financial services. They discovered that financial inclusiveness has an impact on inclusive economic development. And Park and Mercado (2016 and 2018) pointed out that income per capita, legal regulations and demographic characteristics are positively correlated with financial inclusion. Constructing a financial inclusion index for the European Union member and candidate countries to measure the extent of financial inclusion across countries over time, Yorulmaz (2016) studied the impact of financial inclusion on economic growth. He regressed financial inclusion index with other macroeconomic variables (GDP per capita, adult literacy rate, rural populations, unemployment rate, Gini-coefficients and human capital development index). The main findings of the work show a positive and significant correlation between financial inclusion index and income; between financial inclusion index and human capital development; but negative correlation with unemployment rate and Gini-coefficient.

In a related study titled "the nexus between financial development and economic growth in Poland from 1990 to 2018. Škare *et al.* (2019) analyzed this using the VECM, and they showed that financial services may possibly have long memory properties and that researching the financial development–growth nexus could require using fractional integration methods. The evidence equally suggested that financial development plays a significant role in both economic and credit growth. In line with this, Puatwoe and Piabuo (2017) obtained a positive association between financial development and economic growth in Cameroon. I the like manner, Jung (2017), using VAR technique on the South Korean data from 1961 to 2013, showed that financial development led to increase in economic growth and that there was a unidirectional causality from financial development through economic growth but not vice-versa. Conversely, Sekakela (2018) carried out a country-specific analysis of financial development and growth in Botswana, covering the period 1980 to 2014. Using the ARDL technique, the researcher established that financial development has a significant and negative impact on economic growth, both in the long run and the short run.

In previous study by Kim et al. (2018) on relationship between financial inclusion and economic growth in Organization of Islamic Cooperation (OIC) countries by the dynamic panel estimation, but also the panel VAR, IRFs, and panel Granger causality tests. Based on it, they find that financial inclusion has a positive effect on economic growth, and financial inclusion and economic growth have mutual causalities with each other based on the panel Granger causality tests. In a similar study from Makina and Walle (2019) which focus on Africa, a continent with the lowest financial inclusion level in the world. Despite long-dated time-series data constraints,

the study finds that financial inclusion – as measured by the dimension of access – has a significantly positive effect on economic growth in Africa. The finding reinforces the need for greater efforts to pursue the financial inclusion agenda as one of the most effective tools for realizing inclusive growth. Specifically, empirical results from Sharma (2016) suggest that there is a positive association between economic growth and various dimensions of financial inclusion. Specifically, banking penetration, availability of banking services and usage of banking services in terms of deposits. The results obtained favour social banking experiments in India with a deepening of banking institutions.

In Bangladesh, since the introduction of financial inclusion in the mid-1970s, financial inclusiveness showed a positive impact in driving the country's economic growth, especially for the lower-income group, through poverty alleviation and improvement in their living standards (Ibor et al., 2017).

Chauvet and Jacolin (2017) showed that lack of financial inclusion coupled with low institutional quality and information asymmetries has a negative impact on financial development (that is, economic growth). More specifically, the study shows that low financial inclusion leads to a crowding out effect in favour of the government of a small number of firms or a reversal of the expected positive impact of financial development on economic growth. Similarly, the study by Law and Kutan (2018) concluded that the quality of institutions is crucial in mediating the positive relationship between banking sector development and economic growth.

## 4. METHODOLOGY

### 4.1. Data Sources and Variable Definition

This study on examining financial inclusion, performance and economic prosperity utilizes time series data sourced from 54 African countries spanning from 2000 to 2020. This period was selected due to the availability of relevant data required for the study. The dataset was sourced from World Bank's Global financial index (GlobalFindex), World Development indicator (WDI) and Legathum Prosperity Index annual fact sheets. The variables used in the model are measures of financial inclusion such as number of registered mobile accounts for every 100,000 adults (NRMA), number of agent mobile money outlets per 100,000 adults (NAMO), and financial literacy (FINLIT); measures of financial performance which include return on assets (ROA); measure of economic prosperity – prosperity index (P-Index); and we controlled for consumer price index (CPI), and real exchange rate (REXR). For clearer understanding, we define each of the model variables in Table 1.

**Table 1:** Definition of Model Variables.

| Variables | Definition | Expected Sign |
|---|---|---|
| P-INDEX | Prosperity Index | To be Determined |
| NRMA | Number of registered mobile money accounts/100,000 Adults | Positive |
| NAMO | Number of agent mobile money outlets per 100,000 Adults | Positive |
| FINLIT | Financial literacy | Positive |
| ROA | Return on assets | |
| Control Variables | | |
| CPI | Consumer Price Index | Positive |
| REXR | Exchange rate | Positive |

The ubiquity of financial inclusion and financial performance on economic prosperity of cannot overemphasized. The effects of financial inclusion transcends in people's welfare, standard of living, social status, financial capacity, consumption level, per capita income and level of happiness. Financial inclusion reshape the way money is being earned, spent, save and used to fulfill all financial obligations by individuals and firms. With financial inclusion tools, households can access funds with ease and convenient to set up small and medium enterprises, which in turn lead to economic prosperity.

This study however, utilized time series variables which include number of registered mobile accounts /100,000 adults (NRMA), number of agent mobile money outlets per 100,000 adults (NAMO), and financial literacy (FINLIT), return on assets (ROA); prosperity index (P-Index), consumer price index (CPI), and real exchange rate (REXR). However, the characteristics of the variables was assessed using the mean, median, standard deviation, minimum, maximum, Skewness, Kurtosis and Jarque-Bera statistics as shown in table 2. The validity of the variables in this paper are supported by the mean, median, skewness, minimum and maximum variations of the variables. The variables are normally distributed as signposts by Jarque-Bera statistics.

**Table 2:** Descriptive Statistics and Correlation Matrix.

| | P-INDEX | NRMA | NAMO | FINLIT | ROA | CPI | REXR |
|---|---|---|---|---|---|---|---|
| Mean | 0.304 | 0.229 | 4.188 | 0.847 | 3.588 | 4.664 | 9.366 |
| Median | -0.235 | 0.000 | 4.591 | 0.493 | 3.251 | 3.052 | 8.874 |
| Maximum | 9.963 | 10.47 | 4086. | 68.46 | 98.12 | 252.1 | 91584 |
| Minimum | -2.243 | -1.816 | -2.449 | -3.977 | 3.010 | 4.366 | 0.003 |
| Std. Dev. | 1.920 | 1.430 | 3172. | 3.439 | 23.88 | 42.32 | 2782. |
| Skewness | 1.841 | 2.010 | 9.683 | 14.48 | 0.661 | 2.191 | 32.86 |
| Kurtosis | 6.948 | 12.46 | 102.7 | 237.2 | 2.557 | 8.493 | 1080. |
| Jarque-Bera | 1326. | 4813. | 4699. | 2535 | 88.55 | 2247. | 5263. |
| Probability | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| P-INDEX | 1 | | | | | | |
| NRMA | 0.848 | 1 | | | | | |
| NAMO | 0.475 | -0.380 | 1 | | | | |
| FINLIT | -0.735 | -0.381 | -0.036 | 1 | | | |
| ROA | 0.955 | -0.085 | -0.065 | -0.016 | 1 | | |
| CPI | -0.340 | -0.077 | -0.013 | -0.033 | 0.017 | 1 | |
| EXR | -0.021 | -0.104 | 0.024 | -0.076 | 0.046 | 0.069 | 1 |

Furthermore, the value of the mean and median of the variables are not too far from each which implies that there is no presence of extreme outliers, therefore making the variables normal for the analysis. The standard deviation, the Kurtosis and Skewness statistics shows that the differences in the variables are not too significant, which means that financial inclusion and financial performance are capable of transmitting economic prosperity in Africa over the period of 2000 to 2020 and can be significant after being normalized.

In the like manner, the results of the correlation matrix suggested an existence of correlation between financial inclusion, financial performance and economic prosperity. However, closer look on the result shows that positive correlation exists between number of registered mobile money accounts per 100,00 adults, number of mobile money agent outlet per 100,000 adults, financial literacy, exchange rate and economic prosperity on one hand; and negative correlation exists between return on assets and consumer price index on the other hand. The negativity of the later could attributed to poor macroeconomic and institutional quality in most African countries. This result however, attests that great link exists between financial inclusion, financial performance and economic prosperity in Africa. Below in table 3 is the list of the selected countries.

## 4.2. Model Specification

### 4.2.1. Baseline Panel Dynamic ARDL Model

To examine financial inclusion, financial performance and economic prosperity in Africa, we employed panel dynamic ARDL model given that it gives room to distinguish between long-run and short-run relationships and our focus are based on mean group (MG) estimator proposed by Pesaran and Smith (1995); dynamic fixed effects (DFE) and pooled mean group (PMG) estimator proposed by Pesaran et al. (1999). By employing an ARDL (p, q) approach, Pesaran and Smith (1995), Pesaran et al. (1999) introduced dynamic heterogeneous panel regression in an error-correction form, where p and q are the lags of the dependent and independent variables respectively. For the sake of clarity, the model for this study will be categorized into two with our major interest on (a) the nexus between financial inclusion and economic prosperity; (b) the nexus between financial performance and economic prosperity. Thus the equations can be written as follows:

$$\Delta Yi,t = \varphi i[Yi,t-1-\{\beta i,0+\beta i,1Xi,t-1\}]+\sum_{j=1}^{p-1}\varpi i.j\Delta Yi,t-j+\sum_{j=0}^{q-1}\eta i.j\Delta Xi,t-j+\varepsilon i,t \quad (1)$$

Where $Y$ represents measures of financial inclusion (MFI) such as (number of registered mobile money accounts/100,000 adults (NRMA), number of mobile money agent outlets per 100,000 adults (NAMO), and financial literacy (Fin-Lit) as well as measures of financial performance (MFP) which include return on assets (ROA) for country $i$ at year $t$ and $X$ represents the vectors of economic prosperity which was measured with prosperity index (P-INDEX). $\varpi$ and $\eta$ denotes the short-run coefficients for lag of the dependent variables and other regressors respectively, while $\beta$ represents the long-run coefficients. $\phi$ is the speed of adjustment of the long-run equilibrium and the first term on the right-hand side of Equations (1) will capture any long-run relationship between financial inclusion, financial performance and economic prosperity. As the system is expected to return to the long-run equilibrium, we expect $\phi < 0$.

In terms of estimating equation (1) and 2, the MG approach of Pesaran and Smith (1995) initially estimates individual regressions for each country and subsequently, group coefficients are calculated by averaging country coefficients. Moreover, Pesaran and Smith (1995) show that this approach produces consistent estimates of the

averages as long as N and T are reasonably large. Of course, this method also allows all coefficients to be heterogeneous. A very different approach taken by our second estimator (the DFE estimator). Apart from intercepts, DFE estimator calculates other coefficients and error variances homogenously across countries. Finally, the pooled mean group (PMG) estimator of Pesaran et al (1999) assumes the long-run coefficients are homogenous across countries but allows for heterogeneity in the short-run for coefficients, intercepts, the speed of adjustment coefficients and error variances. Thus, if this long-run homogeneity assumption holds, which can be tested by a Hausman test, the pooled mean group (PMG) estimator will be more efficient than mean group (MG) estimator because it reduces the magnitude of the long-run coefficient standard error. Note that Pesaran et al. (1999) show the consistency and asymptotic distributions of the PMG estimators, under certain regularity conditions, in the cases where regressors are either I(0) or I(1).

Following the previous study conducted by Manasseh et al. (2019), we use the Hausman test to choose the most appropriate estimator. The null hypothesis of the Hausman test is that the difference between a pair of estimators is not significant and we employ a 5 percent level of significance. Finally, we impose an ARDL lag structure as follows; p = 1 and q = 1 (for all regressors) based on Akaike Information Criterion (AIC). In fact, this specification p = 1 and q = 1 has been widely used in previous studies that employed ARDL models to test varieties of economic issues (see: Metai, 2020; and Beck et al. 2000) among others.

However, in order to correct the problem of endogeneity which the first three estimators: mean group (MG), dynamic fixed effects (DFE) and pooled mean group (PMG) cannot handle, we introduced panel generalized method of moment (GMM) panel data estimator originally proposed by Holtz-Eakin et al. (1988) and subsequently extended by Arellano and Bond (1995) and Blundell and Bond (1998). There are several advantages to applying this method over cross section and other panel data methods. First, GMM allows us to control for country-fixed effects and time fixed effects. And second, it also allows us to use appropriate lags of the dependent variable as instruments to deal with possible endogeneity in the regressors. Thus, following ---------, the generalized method of moment equation for examining financial inclusion, financial performance and economic prosperity in Africa is expressed as follows:

$$Yit - Yi,t-1(1-\alpha)Yi,t-1 + \beta 1 it + \beta 2Xit + \eta i + \lambda t + \varepsilon it \quad (2)$$

This equation can be rewritten alternatively as follows:

$$Yit = \alpha Yi,t-1 + \beta it + \beta 2Xit + \eta i + \lambda t + \varepsilon it \quad (3)$$

Where $i$ is country index, $t$ is the time index, $Y$ is used to denote the measures of financial inclusion and performance, M represents the measures of economic prosperity, $X$ is the vector of the explanatory variables that affects economic prosperity, $\eta_i$ is the unobserved country fixed effects, $\lambda_t$ is the time fixed effects and $\varepsilon_{it}$ is the error term.

In order to estimate equation (3), applying within group (the fixed effects) estimation method will make the estimates to be yield spurious result due to existence of the country fixed effects $\eta_i$ which is correlated with the lagged dependent variable $Y_{i,t-1}$. In that case, estimates will be inconsistent even when the error term $\varepsilon_{it}$ is not serially correlated. To eliminate the country-specific effects, we transform equation 3 in to first difference as follows:

$$Yit - Yi,t-1 = \alpha(Yi,t-1 - Yi,t-2) + \beta 1(Mit - Mit-1) + \beta 2'(Xit - Xi,t-1) + (\lambda t - \lambda t-1) + (\varepsilon it - \varepsilon i,t-1) \quad (4)$$

The estimation of the above equation requires the use of instruments since the new error term, $(\varepsilon_{it} - \varepsilon_{i,t-1})$, is correlated with the lagged dependent variable, $(Y_{i,t-1} - Y_{i,t-2})$, and the explanatory variables $(X_{it})$ are potentially endogenous.

### 4.3. Robustness Check – Panel Differenced and System GMM

To address these two issues which MG, DFE and PMG estimators cannot handle, Arellano and Bond (1991) proposed an estimation method where the lagged levels of the regressors are used as instruments under two conditions:

A. The idiosyncratic error term $\varepsilon_{it}$ is not serially correlated
B. The explanatory variables contained are weakly exogenous (i.e. they are uncorrelated with the future realizations of the idiosyncratic errors).

This is known as the differenced GMM estimator. The following moment conditions are used by the first differenced GMM estimators:

$$E[Y_{i,t-s}(\varepsilon_{it} - \varepsilon_{i,t-1})] = 0 \text{ for } s \geq 2; t = 3,.....T$$

$$E[M_{i,t-s}(\varepsilon_{it} - \varepsilon_{i,t-1})] = 0 \text{ for } s \geq 2; t = 3,.....T$$

$$E[X_{i,t-s}(\varepsilon_{it} - \varepsilon_{i,t-1})] = 0 \text{ for } s \geq 2; t = 3,.....T$$

The above moment conditions imply that the twice and further lagged values of financial inclusion measures, financial performance measures, economic prosperity and other explanatory variables can be used as instruments to obtain the first differenced GMM estimators. Although, the differenced GMM estimators outlined can control

for fixed effects and endogeneity bias, Alonso-Borrego and Arellano (1999) and Blundell and Bond (1998) pointed out that lagged levels of the variables become weak instruments in the first difference equations when the explanatory variables are persistent over time, which can lead to finite sample bias and the variance of the coefficients may get larger asymptotically.

Therefore, to deal with this potential bias and imprecision of the estimates of the difference GMM method, Arellano and Bover (1995) suggested an alternative estimator combining the equation in difference and in level (i.e. equations 2 and 3). They proposed the lagged differences of the explanatory variables as the instruments of the equation in the levels. The estimators are based on the moment conditions associated with this system equations as known as system GMM estimators. In order to ensure validity of additional instruments, an additional assumption is made: the first differences of the independent variables in equation 3 are uncorrelated with country fixed effects $\eta_i$. In order to satisfy this assumption, the system GMM estimators used the following moment conditions for the equation in levels:

$$E[Y_{i,t-s}Y_{i,t-s-1}(\eta_i + \varepsilon_{it})] = 0 \text{ for } s = 1$$

$$E[\mathrm{M}_{i,t-s}\mathrm{M}_{i,t-s-1}(\eta_i + \varepsilon_{it})] = 0 \text{ for } s = 1$$

$$E[X_{i,t-s}X_{i,t-s-1}(\eta_i + \varepsilon_{it})] = 0 \text{ for } s = 1$$

In the case of the above, the moment conditions implies that the first lagged difference of financial inclusion, financial performance and economic prosperity measures as well as other explanatory variables included in $X$ can be used as instruments for the equation in levels. The consistency of the GMM estimator depends on two specification tests namely: the Hansen J test of over-identifying restrictions and serial correlation test in the disturbances. The Hansen J test has a null hypothesis of "the instruments as group are exogenous". Failure to reject the null of the Hansen J test would imply that the instruments are valid and the model is correctly specified. Therefore, the higher the p-value of the Hansen J test statistic, the better it is. With respect to the serial correlation test, one should rejects the null of the absence of the first order serial correlation (AR1) and should not reject the absence of the second order serial correlation (AR2).

## 5. ANALYSIS OF EMPIRICAL RESULTS

### 5.1. Unit Root Test

We carried out test for unit root in this study as shown in Table 3 to ascertain if there is unit root in the series or not. Panel unit root tests such as Levine, Lin and Chu – LLC (2002), Im, Pesaran and Shin – IPS (IPS), and combined Fisher tests such as Fisher-ADF and Fisher-PP tests was employed to test for unit root in the series. This test is based on the null hypothesis (no unit root) and the decision rule is to reject the null hypothesis if the probability value is less than 0.05. Findings from the results shows that the null hypothesis no unit root be rejected since the P-values of the LLC, IPS, Fisher ADF and PP for all the variables are less than 0.05. Furthermore, the variables was found to be integrated of either order I(0) and I(1) which makes the variables more suitable for estimation of ARDL model and no variable was found to be non-stationary, integrated of order (2) or above which violates the rule for the estimation of panel ARDL.

**Table 3:** Results of Unit Root Test.

| Variable | LLC | IPS | Fisher-ADF | Fisher-PP | Integration Order | |
|---|---|---|---|---|---|---|
| | | | | | Level | First Diff. |
| P-INDEX | -2.951*** | -2.590*** | 147.2*** | 146.7*** | I(0) | _ |
| | (0.001) | (0.004) | (0.003) | (0.003) | | |
| NRMA | -8.153*** | -9.403*** | 293.4*** | 283.7*** | I(0) | _ |
| | (0.000) | (0.000) | (0.000) | (0.000) | | |
| NAMO | -32.63*** | -14.31*** | 690.5*** | 760.2*** | I(0) | _ |
| | (0.000) | (0.000) | (0.000) | (0.000) | | |
| FINLIT | -8.785*** | -7.949*** | 258.9*** | 254.4*** | I(0) | _ |
| | (0.000) | (0.000) | (0.000) | (0.000) | | |
| ROA | 13.04*** | 4.102*** | 86.64*** | 85.98*** | _ | I(1) |
| | (0.000) | (0.000) | (0.000) | (0.002) | | |
| CPI | -22.47*** | -19.51*** | 527.2*** | 561.5*** | _ | I(1) |
| | (0.000) | (0.000) | (0.000) | (0.000) | | |
| REXR | -13.94*** | -11.34*** | 397.9*** | 847.7*** | _ | I(1) |
| | (0.000) | (0.000) | (0.000) | (0.000) | | |

**Note:** (.) Probability value; ***, **, and * represents 1%, 5% and 10% level of significance; I(0) represents integration order at level; and I(1) represents integration order at first difference.

### 5.2. Results for Pedroni and Kao Cointegration Test

Haven confirmed that the series has no unit root and the variables are integrated and did not violate the assumptions of ARDL, we move to investigate further the existence of cointegration between the variable. We employed Pedroni (2004) cointegration test, which was complimented with Kao (1999) cointegration test as the robustness check to investigate if cointegration exist between financial inclusion, financial performance and economic prosperity as shown in Table 4 below.

**Table 4:** Summary of Results of Cointegration Tests.

| Models | Panel-v | Panel-rho | Panel-PP | Panel-ADF | Group-rho | Group-PP | Group-ADF | Kao test (Robust. Check) |
|---|---|---|---|---|---|---|---|---|
| Financial Performance and Economic Prosperity | | | | | | | | |
| Model 1 | -4.822*** | 4.719*** | 0.436 | 1.025 | 6.72*** | -4.959*** | -2.841*** | -13.10*** |
| | (0.000) | (0.000) | (0.668) | (0.847) | (0.000) | (0.000) | (0.002) | (0.000) |
| Model 2 | -0.909 | 2.075 | -9.873*** | -8.731*** | 5.572*** | -11.84*** | -6.939*** | -3.906*** |
| | (0.818) | (0.981) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Model 3 | -4.715*** | 5.764*** | 0.049 | 15.36*** | 8.783*** | 0.400 | 18.86*** | 4.342*** |
| | (0.000) | (0.000) | (0.519) | (0.000) | (0.000) | (0.655) | (0.000) | (0.000) |
| Model 4 | -2.097 | 3.502 | -6.850*** | -5.954*** | 6.206*** | -8.250*** | -5.349*** | 6.078*** |
| | (0.982) | (0.999) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |

**Note:** (.) represents P-value; ***, **, and * denotes 1%, 5% and 10% level of significance. Decision was based on 5% significant level.

Evidence from the results of Pedroni test entails that cointegration exists between Financial Inclusion, Financial Performance and Economic Prosperity for all the estimated models since the probability values of at least 5 out of 7 tests of Pedroni are less than 5% level of significance (see table 5). Based on these findings, we employed Kao (1999) cointegration test to robust check the earlier findings. The probability values of the ADF statistics for all the models are less than 0.05. Thus, the result confirmed that there is existence of cointegration between financial inclusion, financial performance and economic prosperity.

### 5.3. Estimated Long-Run ARDL Results for Financial Inclusion, financial performance and Economic Prosperity

Having confirmed the existence of cointegration between the variables of financial inclusion, financial performance, and economic prosperity for all the specified models, it becomes vital to further examine the long-run relationship for the specified models. We employed panel autoregressive distributed lag (ARDL) model order (k, e, r, t, n, m) following Sakanko et al. (2019) and the results are presented in Table 5.

**Table 5:** Summary of Long-Run ARDL Result.

| | Model 1 | | | Model 2 | | | Model 3 | | | Model 4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MG | DFE | PMG | MG | DFE | PMG | MG | DFE | PMG | MG | DFE | PMG |
| P-Index(-1) | 0.018 | 0.017 | 0.035 | 0.568 | 0.568 | 0.636 | 0.770 | 0.319 | 0.053 | 0.179 | 0.176 | 0.177 |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.0004) | (0.000) | (0.000) | (0.000) |
| NRMA | 0.036 | 0.038 | 0.049 | | | | | | | | | |
| | (0.023) | (0.002) | (0.000) | | | | | | | | | |
| NAMO | | | | -0.026 | 0.015 | 0.276818 | | | | | | |
| | | | | (0.000) | (0.000) | (0.0029) | | | | | | |
| FINLIT | | | | | | | -0.505 | -0.055 | -0.808 | | | |
| | | | | | | | (0.000) | (0.000) | (0.226) | | | |
| ROA | | | | | | | | | | -0.731 | 0.581 | 0.134 |
| | | | | | | | | | | (0.010) | (0.000) | (0.000) |
| CPI | 0.616 | 0.634 | 0.450 | -7.405 | -0.122 | -0.117 | -0.171 | -0.015 | 0.016 | 0.015 | -0.968 | -0.560 |
| | (0.008) | (0.863) | (0.446) | (0.000) | (0.543) | (0.071) | (0.025) | (0.024) | (0.000) | (0.036) | (0.018) | (0.171) |
| REXR | 0.074 | 0.406 | 0.017 | 0.716 | 0.767 | 0.030 | -0.431 | 0.013 | 0.454 | 0.573 | 0.230 | 0.026 |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.026) | (0.000) | (0.845) | (0.013) | (0.000) |
| Hausman | | | 3.533 | | | 4.691 | | | 92.13 | | | 23.69 |
| | | | (0.613) | | | (0.562) | | | (0.000) | | | (0.007) |
| Normality | 156.3 | 146.7 | 482.9 | 140.4 | 54.45 | 105.9 | 108.9 | 648.6 | 67.73 | 35.65 | 40.79 | 107.9 |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Serial Corr. | 6.496 | 6.958 | 0.306 | 2.849 | 0.120 | 9.441 | 9.242 | 20.36 | 1.575 | 1.864 | 0.095 | 16.84 |
| | (0.116) | (0.906) | (0.579) | (0.573) | (0.094) | (0.688) | (0.231) | (0.236) | (0.560) | (0.837) | (0.759) | (0.280) |
| Ramsey | 0.338 | -0.014 | -0.193 | -0.778 | -0.262 | -0.577 | -0.097 | 0.566 | 0.295 | -0.605 | -0.694 | 0.131 |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Heterosc. | 0.846 | 0.252 | 0.288 | 1.532 | 1.348 | 1.532 | 16.69 | 11.81 | 8.387 | 0.231 | 2.868 | 0.344 |
| | (0.720) | (0.915) | (0.953) | (0.160) | (0.221) | (0.160) | (0.780) | (0.573) | (0.993) | (0.999) | (0.753) | (0.975) |

**Note:** (.)=p-values; ***, ** and * represents 1%, 5% and 10% level of significance; In shows that the models are in natural logarithm.

To satisfy basic OLS estimation assumptions, we carried out normality test, Breusch-Godfrey serial correlation test, Ramsey Reset test and White Heteroscedasticity test for all the estimated models and the results show that the error terms of the models are normally distributed, serially uncorrelated and homoscedastic and all the models were correctly specified. Findings from the estimated results shows that financial inclusion and financial performance are major determinants of economic prosperity in Africa. Economic prosperity was proxied with prosperity index (P-Index); and financial inclusion was measured with number of registered mobile money account per 100,000 adults (NRMA), number of mobile money agent outlets per 100,000 adults (NAMO), and financial literacy (FINLIT); while financial performance was proxy of return on assets (ROA), and we controlled for consumer price index (CPI), and real exchange rate (REXR) see Table 5. Furthermore, the choice of most appropriate model to use for the estimation was done based on the results of the Hausman test. The result of the Hausman test, suggest PMG as the best model for the estimation. Also, the validity of the long-run homogeneity

restriction across countries makes PMG estimator superior over MG and DFE estimators. Findings from the results entails that significant relationships between economic prosperity, financial inclusion and financial performance in the long-run. Financially inclusive economies deliver significant benefits to various stakeholders in the economy by reducing poverty, increasing income, which leads to fewer income inequalities and economic prosperity even to rural dwellers. According to report from World Bank 2017 publication, financial inclusion is a necessity for all, especially for the world's poor population working in an informal sector. It helps individuals to make daily transactions reliably, it aids in accessing credit which can be invested in their small-scale income-generating activities. It provides households and firms with greater access to resources needed for financial consumption and investment and thereby raise the level of economic activities, which in turn increase economic prosperity. Financial inclusion also aids people in securing financial services and products at economical prices such as deposits, fund transfer services, loans, insurance, and payment services. The aim of financial inclusion centers on establishing proper financial institutions to cater for the needs of the people. The performance of financial institutions however, in aiding economic prosperity cannot be over emphasized. It promotes economic growth through capital accumulation and technological progress by increasing the savings rate, mobilizing and pooling savings, producing information about investment, facilitating and encouraging the inflow of foreign capital, as well as optimizing the allocation of capital. Economic growth is essential because it makes countries to eventually eliminate extreme poverty, poor health and inadequate education. These findings are in consonance with finance-growth theories by Schumpeter (1911), Goldsmith (1969), McKinnon (1973), Shaw (1973), Gurley and Shaw (1955), Patrick (1966), and Levine (1997).

### 5.4. Short-Run Error Correction Results

Since the existence of long-run relationship has been confirmed from the long-run successive component of the ARDL equation for the specified models, there is a great need to account for the short-run effects of financial inclusion, and financial performance on economic prosperity in Africa. We apply the short-run dynamics of the ARDL error correction model with Akaike Information Criterion as the lag-length. Notably, in order to satisfy the assumptions of the ARDL, the coefficients of the short-run error correction term (ECT (-1)) must be statically significant and have negative sign. The ECT measures the speed of adjustment from the short-run to the long-run.

**Table 6:** Results of the Short-Run Error Correction.

| | **Model 1** | | | **Model 2** | | | **Model 3** | | | **Model 4** | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **MG** | **DFE** | **PMG** | **MG** | **DFE** | **PMG** | **MG** | **DFE** | **PMG** | **MG** | **DFE** | **PMG** |
| ECM(-1) | -0.703 | -0.982 | -0.686 | -0.542 | -0.431 | -0.454 | -0.368 | -1.319 | -0.308 | -0.156 | -0.823 | -0.239 |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| ΔNRMA | 0.817 | 0.034 | -0.225 | | | | | | | | | |
| | (0.261) | (0.082) | (0.554) | | | | | | | | | |
| ΔNAMO | | | | -0.593 | -0.029 | 0.019 | | | | | | |
| | | | | (0.851) | (0.125) | (0.065) | | | | | | |
| ΔFINLIT | | | | | | | 0.087 | -0.055 | -0.033 | | | |
| | | | | | | | (0.763) | (0.639) | (0.526) | | | |
| ΔROA | | | | | | | | | | -0.120 | 0.153 | -0.450 |
| | | | | | | | | | | (0.537) | (0.000) | (0.000) |
| ΔCPI | 0.889 | 0.634 | 0.013 | -8.816 | -0.122 | 0.341 | -0.260 | -0.015 | -0.072 | 0.456 | 0.081 | 0.096 |
| | (0.075) | (0.363) | (0.617) | (0.793) | (0.543) | (0.397) | (0.000) | (0.024) | (0.721) | (0.940) | (0.537) | (0.595) |
| ΔREXR | 0.134 | 0.022 | -0.043 | 0.353 | 0.767 | -0792 | -0.860 | 0.043 | -0.066 | 0.673 | 1.456 | -0.689 |
| | (0.648) | (0.000) | (0.687) | (0.117) | (0.000) | (0.119) | (0.922) | (0.016) | (0.002) | (0.592) | (0.149) | (0.104) |

**Note:** (.)=p-values; ***, ** and * represents 1%, 5% and 10% level of significance; ln shows that the models are in natural logarithm; Δ=first different; and ECT=error correction term.

Findings from table 6 suggests that the coefficients of the ECT in all the specified models have negative sign and statistically significant (see table 6) which implies that there is short-run dynamics of in various degrees following the outcomes of the specified models. These findings tallies with earlier findings by Lenka and Sharma (2017), Shihadeh (2018), Gourene and Mendy (2017), Dumitrescu and Hurlin (2012), Saab (2017), Williams et al. (2017), Kim et al. (2018), Adegoke and Adgbola (2017), Gretta (2017) and Okoye et al. (2017) among others.

### 5.5. Robustness Check

Panel time series data if not properly handled often yield spurious result due to existence of the country fixed effects which are correlated with the lagged dependent variable. It makes estimates inconsistent even when the error term are serially uncorrelated. To tackle these problems as well as the problem of endogeniety, we employed generalized method of moment (GMM) estimation technique, which was proposed by Arellano and Bond (1991) and extended by Arellano and Bover (1995). However, our major aim was to ascertain if long-run relationship truly exist between financial inclusion, financial performance and economic prosperity in Africa. However, the decision rule to determine which result to be used was bade on the assumption guiding GMM test. The coefficient of the lagged dependent variables of pool mean group (PMG) result was seen as the upper-bound,

while the coefficient of lagged dependent variable of fixed effects model was seen as the lower-bound. Our decision was based on comparing the coefficients of lagged dependent variable of difference GMM result with that of fixed effect result. If the coefficient of lagged dependent variable of different GMM is closer or less than the fixed effect coefficient, it is said to be downward biased, thereby making system GMM suitable for the estimation (see Table 7).

**Table 7:** Estimated Results for Generalized Method of Moment.

| | **Model 1** | | **Model 2** | | **Model 3** | | **Model 4** | |
|---|---|---|---|---|---|---|---|---|
| | **Diff. GMM** | **System GMM** | **Diff. GMM** | **System GMM** | **Diff. GMM** | **System GMM** | **Diff. GMM** | **System GMM** |
| P-Index(-1) | 0.726 | 1.373 | -0.857 | -5.818 | 0.719 | -6.117 | -0.090 | -4.918 |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.005) |
| NRMA | 0.650 | 0.021 | | | | | | |
| | (0.917) | (0.000) | | | | | | |
| NAMO | | | 0.313 | -1.401 | | | | |
| | | | (0.000) | (0.343) | | | | |
| FINLIT | | | | | 0.026 | 0.971 | | |
| | | | | | (0.000) | (0.000) | | |
| ROA | | | | | | | -2.948 | 2.178 |
| | | | | | | | (0.007) | (0.000) |
| CPI | -0.439 | -9.564 | 1.817 | -6.795 | 5.419 | 1.057 | 1.818 | 2.920 |
| | (0.146) | (0.000) | (0.000) | (0.006) | (0.000) | (0.000) | (0.001) | (0.349) |
| REXR | -0.431 | -9.605 | 0.073 | -0.128 | -0.331 | -0.664 | -0.030 | -0.102 |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| No. of Obs. | 960 | 908 | 918 | 908 | 972 | 908 | 918 | 908 |
| J-Statistic | 45.57 | 3.129 | 48.76 | 3.998 | 53.26 | -7.138 | 158.8 | 4.817 |
| | (0.323) | (0.238) | (0.241) | (0.234) | (0.276) | (0.784) | (0.321) | (0.374) |
| PMG | 0.989 | | 0.472 | | 0.044 | | 0.510 | |
| Fixed Effects | 0.447 | | 0.874 | | 0.706 | | 0.088 | |

**Note:** (.)=p-values; ***, ** and * represents 1%, 5% and 10% level of significance.

The results of both financial inclusion and economic prosperity as well as financial performance and economic prosperity also confirmed that long-run relationships exists between financial inclusion, financial performance and economic prosperity in Africa. The performance of financial inclusion and the overall performance of the financial systems in an economy brings about economic prosperity (see Schumpeter, 1911; Goldsmith, 1969; McKinnon, 1973; and Shaw 1973). Economic prosperity identifies the elements of quality of good life. The soundness of the wealth in, standard of the living, quality of healthcare, education, good governance, natural environment, good economic quality, market access and infrastructure, enterprise conditions, social capital, increased level of happiness, personal freedom, safety and security, the economy must promote innovation and sustain diversity, competition, entrepreneurship, financial inclusion and economic prosperity. Financial inclusion plays a great role in achieving economic prosperity of any economy. Financial inclusion reshape the way money is earn, spent, and saved. It opens the gateway for financial freedom for firms, households, small, micro and medium enterprises (SMEs) and everyone, it brings the surplus units and deficit units in an economy, makes credit easily accessible and solve the problem of income inequalities in an economy. The results of the Sargan – J test of overidentifying restrictions shows that the null hypothesis "overidentifying restrictions are valid" be rejected for all the models since the P-values are greater than 5% (0.05) implying that all the instruments are valid. These findings are in line with the previous studies by Kim et al. (2018), Adegoke and Adegbola (2017), Ozili (2018), Bertram et al. (2016), Park and Mercado (2018), Yorulmaz (2016), Skare et al. (2019), Puatwoe and Piabuo (2017), Sekakela (2018), Makina and Walle (2019), Ibor et al. (2017), Chauvet and Yacolin (2017) and Kutan (2018).

### 5.6. Discussions

In panel studies, it is often noteworthy and very important to check if the selected variables have unit root or not as well as their order of integration. This study employed panel unit root tests such as Levine, Lin and Chu (2002), Im, Pesaran and Shin (2003), Fisher-ADF and Fisher-PP test as proposed by Madala and Wu (1999). Findings suggests that there is no evidence of unit root in the series and the variables are integrated at level and first difference. This study further test for cointegration between the variables by employing Pedroni (2003) test for all the specified models and results entails that cointegration exists between financial inclusion, financial performance and economic prosperity in Africa since at least, 5 out of 7 Pedroni test are statistically significant at 5 percent level of significance and the results was robust checked with Kao (1999) cointegration test which confirmed that cointegration exists between financial inclusion, financial performance and economic prosperity in Africa since the probability values of the ADF statistics are less than 0.05. Haven confirmed the existence of cointegration in the series, this study employed panel dynamic autoregressive distributed lag (ARDL) since it will permit us to assess both long-run and short-run relationships of financial inclusion, financial performance, and economic prosperity in the Africa. Thus, our focus are based on mean group (MG) estimator proposed by Pesaran

and Smith (1995); dynamic fixed effects (DFE) and pooled mean group (PMG) estimator as proposed by Pesaran et al. (1999). The estimation was done in two phases which are (a) nexus between financial inclusion and economic prosperity and (b) nexus between financial performance and economic prosperity for clarity sake. The selection of most suitable estimator for the analysis was based on the result of hausman test. The result entails that PMG estimator is the superior estimator over MG and DFE estimators due to its ability to estimate both long-run and short-run equations at once. The dynamics of lag of dependent variables entails that the impacts of financial inclusion and financial performance on economic prosperity does not just happen spontaneously, it takes time to occur. Therefore, the lag of the dependent variables for the specified models of MG, DFE and PMG estimations shows the degrees at which financial inclusion and financial performance influences economic prosperity. Findings suggests that long-run relationship exists between financial inclusion, financial performance and economic prosperity in Africa since the probability values of the specified models of both nexus between financial inclusion and economic prosperity and nexus between financial performance and economic prosperity are less than 0.05 which suggests the null hypothesis be rejected and therefore lead to conclusion that long-run relationship exists between economic prosperity, financial inclusion and financial performance in Africa.

Different and system generalized method of moment (GMM). GMM model was chosen over other estimation techniques due to its ability to handle endogenity issues which ARDL model cannot handle and also to robust check the earlier findings from the ARDL results. Haven seen the potential biased nature of the GMM estimator, Arellano and Bover (1995) suggested combination of difference and system GMM estimators. They proposed the lagged differences of the explanatory variables as the instruments of the equations in the level which was based on some moment conditions. In order to guarantee the validity of the additional instruments, Arellano and Bover assumed the first differences of the independent variables are uncorrelated with country fixed effects. It is noteworthy to emphasis that selection either differenced or system GMM as the suitable model is determined by comparing the coefficients of the lag of the dependent variable of the fixed effects and pooled mean group (PMG) results. The coefficient of the lagged dependent variables of pool mean group (PMG) result was seen as the upper-bound, while the coefficient of lagged dependent variable of fixed effects model was seen as the lower-bound. If the coefficient of lagged dependent variable of different GMM is closer or less than the fixed effect coefficient, it is said to be downward biased, thereby making system GMM suitable for the estimation and if not, difference GMM becomes the suitable for the estimation. Findings from the results shows that long-run relationships exists between financial inclusion, financial performance and economic prosperity.

However, this study is different from other empirical studies such as Lenka and Sharma (2017), Saab (2017), Adegoke and Adegbola (2017) and Kim et al. (2018) in terms of objective of the study. The studies was based on financial inclusion and economic growth; while we are examining the nexus between financial inclusion, financial performance and economic prosperity. Lenka and Sharma (2017) and Adegoke and Adegbola (2017) are single country studies, while Saab (2017) and Kim et al (2018) are panel studies basing on selected MENA and OIC countries. They all found that financial inclusion affects economic growth positively. But our study extended the scope by examining the nexus between financial inclusion, financial performance and economic prosperity in selected 54 countries of Sub-Saharan Africa. Furthermore, the only study that used one of the estimation techniques our study employed was Kim et al. (2018). They utilized panel dynamic autoregressive distributed lag (ARDL) model with focus on MG, PMG and DFE models. Haven observed that ARDL model is not capable of handling the problem of endogeneity, we robust checked out study, with difference and system generalized method of moment (GMM). Hence, our study concludes that positive long-run relationships exists between financial inclusion, financial performance and economic prosperity in Africa. But in line with the Shihadeh (2018), financial inclusion should be the target of the government, since it increase ease in doing business, aids in increasing standard of living, and leads to economic prosperity.

## 6. SUMMARY, RECOMMENDATION AND CONCLUSION

This study employed dynamic panel autoregressive distributed lag model with emphasis on mean group (MG), dynamic fixed effects (DFE) and pooled mean group (PMG) and panel generalized method of moment (GMM) to ascertain if financial inclusion, and financial performance promote economic prosperity or not in Africa from 2000 to 2020. Various measures of economic prosperity such as education (EDU), health (HELT), social capital (SCAP), gross domestic product per capita (GDPpc) and prosperity index (P-Index) was used to measure economic prosperity. Furthermore, financial inclusion was measured with number of registered mobile money accounts per 100,000 adults (NRMA), number of mobile money agent outlets per 100,000 adults (NAMO), digital card ownership (DCO) and financial literacy (FINLIT); while we measured financial performance with indicators such as return on assets (ROA), return on equity (ROE), and gross domestic product deflator (GDP-DEF). However, the general effects of financial inclusion, financial performance and economic prosperity was controlled with foreign direct investment (FDI), consumer price index (CPI) and real exchange rate (REXR). Findings from cointegration test shows that there are cointegration between financial inclusion, financial performance and economic prosperity. Also, evidence from the results of panel ARDL shows that long-run relationships exists between financial inclusion, financial performance and economic prosperity. The estimates of the models were statistically significant which led to rejection of the null hypothesis and conclusion that there is long-run

relationship between financial inclusion, financial performance and economic prosperity. In the short-run, the dynamics of error correction model shows that there are speeds of adjustment from the short-run to long-run for all the specified models. Panel GMM estimation was carried out as a robustness check to account for the endogeniety problems which MG, DFE and PMG models cannot handle. The results also confirmed that there is long-run relationships between financial inclusion, financial performance and economic prosperity.

Based on the above findings, this study concludes that long-run relationships exists between financial inclusion, financial performance and economic prosperity. Financial inclusion and financial performance was found as major contributors of economic prosperity in Africa. For improved standard of living, per capita GDP, social capital, ease in doing business, and improved healthy lifestyle, inclusive finance should be promoted by governments. Government should improve the quality of fintech tools in Africa like broadband internet network. Bank should endevour to carry out her conventional banking services through digital payment platforms like internet banking, ATM, web transections, and point of sale (POS). Government of African nations are advised to expel poverty and increase people's living standard by providing basic amenities like steady electricity, goods roads, clean water, basic education, and clean environment. Also provision of accessible funds both for individuals and micro, small, and medium enterprises (MSMSEs) to support already existing firms and create a fertile ground for entrant of new firms will go a long way in improving economic prosperity in Africa.

## REFERENCES


Adedeji G, Rolle R (2016). Foreign direct investment and economic growth in developing countries: Panel estimation for Sub-Saharan African countries. International Journal of Development and Management Review 11(1):39-50.

Algan, Y and P Cahuc (2013), "Trust, Growth and Happiness: New evidence and policy implications," in P Aghion and S Durlauf (eds), Handbook of Economic Growth P. Aghion and S. Durlauf, volume 2A.

Anarfo, E. B., Abor, J. Y., Osei, K. A., Gyeke-Dako, A. (2019). Financial inclusion and financial sector development in Sub-Saharan Africa: A panel VAR approach. International Journal of Managerial Finance, 15(3).

Andrew Aitken (2019). Measuring Welfare beyond GDP. National Institute of Economic Review. Sage Journal.

Arockia Ruban &lourdes poobala rayen (2012). Financial Inclusion At: ST. XAVIER'S COLLEGE, PALAYAMKOTTAI, TIRUNELVELI Volume: 1 March 2012

Barro, R. and Sala-I-Martin, X. 1995. Economic Growth. Cambridge, MA: McGraw-Hill.

Bertram, O. A., Nwankwo, S. N. P., & Onwuka, I. O. (2016). Full financial inclusion (FFI): A prerequisite for inclusive economic development in Nigeria. Advances in Social Sciences Research Journal, 3(9), 65–78.

Bist, J.P. (2018), "Financial development and economic growth: evidence from a panel of 16 African and non-African low-income countries", Cogent Economics and Finance, Vol. 6 No. 1, 1449780.

Bjørnskov, C (2012), "How does social trust lead to economic growth?", Southern Economic Journal 78: 1346-1368.

Chauvet, L. & Jacolin, L. (2017). Financial Inclusion, Bank Concentration, and Firm Performance. World Development, 97, issue C, 1-13

De Jager, J. L. W. 2004. Exogenous and Endogenous Growth, University of Pretoria ETD.

Dollar and Kraay, (2002). Growth is good for the poor J. Econ. Growth, 7 (3) (2002), pp. 195-225

Ejemeyovwi JO, and Osabuohien ES (2020) Investigating the relevance of mobile technology adoption on inclusive growth in West Africa. Contemp Soc Sci 15(1):48–61

Fan S., Hazell P., & Thorat S (2000). Government spending, growth and poverty in rural India Am. J. Agric. Econ., 82 (4) (2000), pp. 1038-1051

Fukuyama, F (1995), Trust: the social virtues and the creation of prosperity, New York: Free Press.

Putnam, Robert D (2000), Bowling Alone: The Collapse and Revival of American Community, New York: Simon & Schuster.

Giron, A., Kazemikhasragh, A., Cicchiello, A.F. & Panetti, E. (2021). Financial Inclusion Measurement in the Least Developed Countries in Asia and Africa. Journal of the Knowledge Economy.

Goel, S., & Sharma, R. (2017). Developing a financial inclusion index for India. Procedia Computer Science, 122, 949–956.

Gourene, G.A.Z., Mendy, P. (2017). Financial Inclusion and Economic Growth in WAEMU: A Multiscale Heterogeneity Panel Causality Approach, https://mpra.ub.uni-muenchen.de/82251/1/MPRA_paper_82251.pdf (15.01.2018)

Gretta, S. (2017). Financial Inclusion and Growth. The Business and Management Review.

Gupta, A., Chotia, V., Rao, N. M. (2014). Financial inclusion and human development: A state-wise analysis from India. International Journal of Economics, Commerce and Management, II (5), 1–24.

Harley, T. W., Adegoke, A. J., & Adegbola, D. (2017). Role of Financial Inclusion in Economic Growth and Poverty Reduction Role of Financial Inclusion in Economic Growth and Poverty Reduction. Internal Journal of Research in Economics and Social Sciences (IJRESS), 265-271.

Ibor, B., Ikpa Offiong, A., & Samuel Mendie, E. (2017). Financial inclusion and performance of micro, small and medium scale enterprises in Nigeria. International Journal of Research Granthaalayah, 5(3), 104–122.

Ibrahim, M. and Alagidede, P. (2018). "Effect of financial development on economic growth in sub-Saharan Africa", Journal of Policy Modeling, Vol. 40 No. 6, pp. 1104-1125.

Im, K. S., Pesaran, M. H., Shin, Y. (2003). Testing for unit roots in heterogeneous panels. Journal of Econometrics, 115, 53-74.

Jung, S.M. (2017), "Financial development and economic growth: evidence from South Korea between 1961 and 2013", International Journal of Management, Economics and Social Sciences (IJMESS), Vol. 6 No. 2, pp. 89-106.

Karpowicz, I. (2014). Financial Inclusion, Growth and Inequality: A Model Application to Colombia. IMF WP/14/166.

Kim, D.W., Yu, J.S., Hassan, M.K. (2018). Financial Inclusion and Economic Growth in OIC countries. Research in International Business and Finance, 43, 1–14.

Knack, S and Keefer, P (1997), "Does social capital have an economic pay-off? A cross-country investigation", Quarterly Journal of Economics 112: 1251-1288.

Law, S. H. & Kutan, A. M. & Naseem, N.A.M., (2018). The role of institutions in finance curse: Evidence from international data, Journal of Comparative Economics, Elsevier, 46(1), 174-191.

Lenka, S.K., Sharma, R. (2017). Does Financial Inclusion Spur Economic Growth in India? Journal of Developing Areas, 51(3), 215-228. DOI:10.1353/jda.2017.0069

Luca Ventura, (2021). World most unbanked countries. Global news and insights for corporate financial professionals. Global finance magazine 2021.

MAH, J. S. (2017). Import liberalization, export expansion, and economic growth. Journal of International Trade and Insurance, 18, 1–21.
MasterCard Foundation, (2020). Looking to the Future of Financial Inclusion in Africa. Young African Work 2020
Matthew OA, Babajide AA, Osabohien R, Adeniji A, Ewetan OO, Adu O, Adegboye FB, Olokoyo FO, Adeniran O, Urhie E, Edafe O, Itua O (2020) Challenges of accountability and development in Nigeria. J Money Laundering Control 23(2):387–402.
Mindra, R., Moya, M., Zuze, L. T., Kodongo, O. (2017). Financial self-efficacy: A determinant of financial inclusion. International Journal of Bank Marketing, 35(3), 338–353
Mwaitete, C.P., George, L.A. (2018). Financial Inclusion and Economic Growth a Regression Analysis. Imperial Journal of Interdisciplinary Research, 4(1), 265-288.
Norris, E. D., Ji, Y., Townsend, R., & Unsal, D. F. (2015). Identifying Constraints to Financial Inclusion and Their Impact on GDP and Inequality: A Structural Framework for Policy. IMF Working Paper 22. IMF: Washington DC.
Okoye, L. U., Adetiloye, K. A., Erin, O., & Modebe, N. J. (2017). Financial Inclusion as a Strategy for enhanced Economic Growth and Development. Journal of Internet Banking and Commerce, 112.
Park, C.-Y., & Mercado, R. V. Jr. (2018). Financial inclusion, poverty, and income inequality. The Singapore Economic Review, 63(01), 185–206.
Pesaran, M. H. (2004). General diagnostic tests for cross section dependence in panels (Cambridge Working Paper No. 1229, pp. 1-39). Retrieved from http://ftp.iza.org/dp1240.pdf
Pesaran, M. H. (2007). A simple panel unit root test in the presence of cross-section dependence. Journal of Applied Econometrics, 22, 265-312.
Putnam, Robert D (2000), Bowling Alone: The Collapse and Revival of American Community, New York: Simon & Schuster.
Ravallion M. and Datt, G. (2002). Why has economic growth be more pro-poor in some states of India than others? J. Dev. Econ., 68 (2) (2002), pp. 381-400
Rosikah, Dwi K.P., Muthalib, D.A., Muh, I.A. & Rohansyah, M. (2018). Effects of Return on Assets, Return on Equity, Earning Per Share on Corporate Value. The International Journal of Engineering and Science (IJES). Vol. 7, Issue 3, pp. 6-14, 2018. ISSN (e): 2319 – 1813 ISSN (p): 23-19 – 1805.
Saab, G. (2017). Financial Inclusion and Growth. Business and Management Review, 8(4), 434-441.
Sakanko, M.A., Abu, N. & Joseph D. (2019). Financial Inclusion as Panacea for National Development". Conference: Emerging socioeconomic and political challenges to National Development at: Federal university of Lafia, October 2019.
Sarma, M. (2008). Index of financial inclusion (No. 215). https://doi.org/10.1007/978-81-322-1650-6_28.
Sekakela, K. (2018), "Financial development and economic growth in Botswana", Africa Portal, available at: https://www.africaportal.org/publications/financial-development-and-economic-growth-botswana/.
Sethi, D., Sethy, S. K. (2018). Financial inclusion matters for economic growth in India. International Journal of Social Economics, 46(1), 132–151.
Sharma, D. (2016). Nexus between Financial Inclusion and Economic Growth: Evidence from the Emerging Indian Economy. Journal of Financial Economic Policy, 8(1), 13-36, DOI:10.1108/JFEP-01-2015-0004
Shihadeh, F. H. (2018). How individual's characteristics influence financial inclusion: Evidence from MENAP. International Journal of Islamic and Middle Eastern Finance and Management, 11(4), 553–574.
Triki, T., & Faye, I. (2012). Financial inclusion in Africa. African Development Bank
Wakyereza, R.K.S. (2017), "*The impact of foreign direct investment on economic growth*", Employment and Poverty Reduction in Uganda, p. 383.
Williams, H.T., Adage, A.J., Dare, A. (2017). The Role of Financial Inclusion in Economic Growth and Poverty Reduction in a Developing Economy. Internal Journal of Research in Economics and Social Sciences, 7(5), 265~271.
World Bank (2019). Accelerating Poverty Reduction in Africa: In Five Charts. World Bank Publication October 9, 2019.
Yadav, P., Sharma, A. K. (2016). Financial inclusion in India: An application of TOPSIS. Humanomics, 32(3), 328–351.
Yorulmaz, R. (2016). Construction of a Financial Inclusion Index for The Member and Candidate Countries of the European Union. Sayıştay Dergisi, No.102.
Zahonogo, P. (2017). Trade and economic growth in developing countries: Evidence from sub-Saharan Africa. Journal of African Trade, 3(1–2), 41–56. doi: 10.1016/j.joat.2017.02.001
Zak, P J and Knack, S (2001), "Trust and growth", The Economic Journal 111: 295-321.